Department of Energy (DOE)

FY 2003 Report to Congress

Laboratory Directed Research and Development (LDRD)

at the

DOE National Laboratories

February 2004

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This report is available online at: http://www.mbe.doe.gov/progliaison/ldrd.htm

FY 2003
LDRD Report to Congress

Executive Summary

The Laboratory Directed Research and Development (LDRD) program at the Department of Energy's (DOE's) multi-program National Laboratories, as well as analogous programs at the Department's Plants and at the Nevada Test Site, are Congressionally authorized programs designed to build capability to maintain the vitality of these nationally important institutions. This document fulfills all Congressionally directed LDRD program reporting requirements.

Overall, the multi-program National Laboratories included in this report devoted approximately $356 million to LDRD, funding projects ranging in size from less than $30,000 per year to over $2.5 million, addressing topics that span the entire range of DOE's broad scientific mandate. An analysis of LDRD investments compared to the sources of laboratory funding indicates the LDRD benefits are commensurate with the funding received from defense and non-defense sources.

In response to the fiscal year (FY) 2002 Energy and Water Development Appropriations Conference Report, the Secretary issued guidance requiring all LDRD laboratories to notify other Federal agencies concerning LDRD charges. With the creation of the Department of Homeland Security (DHS), there are additional provisions for the notification of LDRD charges, as well as requirements for acknowledgements regarding the benefits of LDRD, prior to final approval of all DHS projects (see Section 2.4). Collectively these policies provide the basis for the Secretary's affirmation that all FY 2003 LDRD activities derived from funds of other Federal agencies have been conducted in a manner that supports the science and technology development that benefits the programs of the sponsoring agencies and are consistent with the appropriations acts providing funds to those agencies. That required affirmation is included as Appendix 1.

An important component of the LDRD program's contribution to the laboratories' future is its ability to attract promising young scientists and engineers to the institutions. LDRD-funded post-doctoral appointments, for example, supported over 40 percent of all post-doctoral scientists and engineers at the reporting multi-program National Laboratories in FY 2003. In addition, many graduate students participate in LDRD projects, and the LDRD program provides a mechanism for scientists and engineers at the laboratories to keep themselves current in their fields.

The LDRD program is essential to maintaining the vitality of the laboratories that support the Department's missions and national needs. We have carefully reviewed the management and administrative procedures and funding levels at each of the laboratories and will continue to maintain a strong and vital LDRD program at the laboratories.

FY 2003
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1. Introduction

1.1 Background

Pursuant to Congressional intent, the DOE multi-program National Laboratories and Manufacturing Plants, and the Nevada Test Site, operate research and development programs using a small portion of their overall budgets for the purpose of investing in critical future needs. This document reports on the programs for FY 2003.

LDRD, the first of these programs, was implemented at the DOE multi-program National Laboratories to formalize what had been a long-standing practice, authorized by legislation, at the multi-program National Laboratories to use portions of laboratory overhead for critical research and development efforts.

Within the overall context of maintaining the vitality of the laboratories, the specific purpose of the LDRD program is to provide the DOE laboratories with funds to undertake creative and innovative research and development activities in order to:

(1) pursue new and innovative scientific and technological ideas;
(2) enhance the scientific and technological vitality of the institution;
(3) manage strategic direction; and
(4) develop and retain new workforce capabilities.

DOE policy provides clear guidance to ensure effective management and oversight of the LDRD program while supporting the laboratories' abilities to pursue innovative projects. The process is consistent with DOE's management philosophy for all research and development activities, and it includes annual planning and reporting documents as well as program and peer reviews. The National Nuclear Security Administration, the Office of Science, and the Office of Nuclear Energy, Science and Technology serve as cognizant Secretarial officers for the multi-program National Laboratories.

1.2 Purpose of the Report

Formally, this report responds to the Conference Report (106-988) accompanying the Energy and Water Development Appropriations Act for FY 2001, which directed DOE's Chief Financial Officer "to develop and execute a financial accounting report of LDRD expenditures by laboratory and weapons production plant." It also responds to the Conference Report (107-258) accompanying the Energy and Water Development Appropriations Act for FY 2002 which directs the Secretary of Energy to include in the

annual report to Congress for all LDRD activities an affirmation that all LDRD activities derived from funds of other agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the appropriation acts that provided funds to those agencies. Such an affirmation is included in Appendix 1 of this report.

Further, this report addresses Section 3136(b)(1) of the National Defense Authorization Act for FY 1997 (Public Law 104-201), which requires submission by February 1 of each year "a report on the funds expended during the preceding fiscal year on activities under [the LDRD Program]…to permit an assessment of the extent to which such activities support the national security mission of the Department of Energy." As defined in its current Strategic Plan, the Department's national security mission is clearly and comprehensively supported by LDRD activities.

This report addresses how the LDRD program is managed, what research and development activities the funding supports, and why the program is important to DOE and the laboratories. The multi-program National Laboratories organize their respective programs according to their individual needs, however, the LDRD program does have a common administrative approach to Congressional and Departmental guidelines. This report speaks to those commonalities.

This report describes the LDRD program and its implementation at the various DOE multi-program National Laboratories. Newer, analogous programs implemented at the Nevada Test Site and at the manufacturing plants are discussed in detail in Appendices 5 and 6 of this report. They are authorized under separate legislation. The Plant Directed Research, Development and Demonstration (PDRD) program is consistent with Congressional intent as stated in the Energy and Water Development Appropriations Act for FY 2001 (Section 310), and the Defense Authorization Act for FY 2001 (Section 3165) direction to establish a Plant Directed Research, Development, and Demonstration program at the following sites:

- The Kansas City Plant, Kansas City, Missouri;
- The Y-12 Plant, Oak Ridge, Tennessee;
- The Pantex Plant, Amarillo, Texas; and
- The Savannah River Plant, Aiken, South Carolina.

The conference agreement allows for a maximum of 2 percent of the plants' National Nuclear Security Administration (NNSA) operating budget to be utilized for the PDRD program.

The Site Directed Research, Development and Demonstration (SDRD) program is consistent with Congressional intent as stated in Section 310 of Energy and Water Development Appropriations Act for FY 2002 (H.R. 2311) which authorizes a program for directed research and development at the Nevada Test Site (NTS). The conference agreement allows for a maximum of 2 percent of NTS's national security budget to be utilized for the SDRD program.

2. FY 2003 LDRD Program

2.1 Laboratory Strategic Themes/Areas

When planning for the upcoming year's LDRD program, laboratories usually identify several areas of concentration or strategic themes that provide a broad framework for the LDRD program. These areas or themes are used to facilitate enhancing laboratory core competencies that are needed to effectively support current and future DOE and national mission needs. Several of the common themes/areas across the laboratories for the FY 2003 LDRD program included:

- Complex Biological Systems;
- Energy and Environmental Security;
- Environmental Science;
- Improved Remediation and Waste Disposal Technologies;
- International and Homeland Security Technologies;
- Nanotechnology;
- Nuclear Weapons Science and Technology;
- Nonproliferation, Counterproliferation and Arms Control; and
- Petaflops and Computational Science.

It is important to note that not all LDRD projects can or should be classified under such areas because it is the nature of LDRD to respond to the best employee suggested ideas even when they do not fall under a predetermined theme or area. The emphasis of each laboratory on any given topic, and the details of the science and technology a given laboratory considers most germane, will vary according to the needs of the laboratory and the concepts developed and proposed by the laboratory staff. In addition, each laboratory will consider its strategic needs for hiring and retention, and develop a portfolio of LDRD projects designed to ensure that the crucial long term skills and capabilities are enhanced through LDRD investments.

2.2 Financial Information

2.2.1 LDRD Funding Mechanism

The LDRD program is structured to pursue innovative and creative science and technology, often with an emphasis on projects that will contribute to the needs of multiple programs and Federal agencies. The Department views LDRD as a legitimate cost of doing business for all sponsors at the multi-program laboratories. Therefore, to ensure that all users of the laboratories support their fair share of LDRD, the costs are funded as part of laboratory indirect costs, up to a maximum of 6 percent of operating and capital equipment costs, and are treated as normal costs of doing business. As such, all organizations that fund laboratory programs also fund LDRD activities. The capabilities developed and maintained through LDRD, in turn, benefit all laboratory customers. This combination of equitable treatment of laboratory sponsors and multiple benefits derived from LDRD is achievable only through the

indirect cost funding mechanism for LDRD. The combination also underscores the value of the LDRD program to the laboratories and to the Nation.

The pricing policy of DOE is full cost, which includes all direct costs incurred in performing the work, allocable cost incurred by DOE and its contractors at any Departmental facility in performing work on behalf of non-DOE entities, and a Federal administrative charge of 3 percent of these costs. LDRD charges and assessments on Work for Others (WFO) agreements are discussed in more detail in Section 2.4. LDRD is considered an allocable cost in accordance with the terms of the laboratory operating contract and is identified in the laboratory's accounting system. Laboratory indirect costs are applied to all funds that come to the laboratories at rates reviewed by the Department. Exemptions from that assessment are uncommon, require the approval of Federal personnel and are reviewed annually. As a general policy, capital construction costs and major "pass-through" costs are exempted from a full indirect cost assessment, including LDRD.

2.2.2 FY 2003 Expenditures

For FY 2003 the multi-program National Laboratories devoted approximately $356 million to LDRD. The following table shows the LDRD costs by site for FY 2003. For more details on the individual projects conducted at each site, see Note 1. Note 1 provides a project listing by site including project identifier, project name and total FY 2003 project costs. It should be noted that the following table includes all LDRD costs including individual project costs listed in Note 1 and any administrative costs not specifically assigned to individual FY 2003 projects, if applicable.

Table I. FY 2003 LDRD Costs by Laboratory

Laboratory	LDRD Project Costs ($M)
ANL	22.4
BNL	7.8
INEEL	20.2
LANL	96.1
LBNL	10.7
LLNL	65.7
ORNL	16.1
PNNL	17.3
SNL	100.0

2.2.3 FY 2003 LDRD Allocation Percentages

Departmental policy states that the maximum funding level established for LDRD must not exceed 6 percent of the laboratory's total operating budget, including non-DOE funded work for the year, plus an amount of capital equipment not to exceed 6 percent of its total capital

equipment budget for the year. It is important to note that individual LDRD program estimates at each site are approved based on laboratory estimated budgets for the fiscal year. Initial planning bases are derived from funds anticipated. The final percentage calculation is based upon actual LDRD costs and actual operating and capital equipment costs. Table II below includes the FY 2003 end-of-year information. It is important to note that "laboratory costs" are not the amount of laboratory program funding, but rather what was accumulated as costs. Also shown is the cost of work performed on behalf of other Federal agencies and non-Federal customers' WFO programs. LDRD charges and assessments on WFO agreements are discussed in more detail in Section 2.4.

Table II. Reported FY 2003 overall laboratory costs and LDRD costs at participating DOE laboratories.

Laboratory	Laboratory WFO Costs ($M)	Total Laboratory Costs ($M)	LDRD Costs ($M)	LDRD Fraction
ANL	95.3	517.4	22.4	4.33%
BNL	85.5	428.7	7.8	1.82%
INEEL	102.6	722.7	20.2	2.79%
LANL	248.6	1794.5	96.1	5.36%
LBNL	100.1	441.5	10.7	2.42%
LLNL	283.5	1272.2	65.7	5.16%
ORNL	172.6	690.5	16.1	2.33%
PNNL	94.5	452.7	17.3	3.82%
SNL	451.3	1742.9	100.0	5.74%

In addition, an analysis of the FY 2003 LDRD program was conducted as it relates to funding received from both defense and non-defense sources (including DOE and WFO sponsors) and the return on the dollars invested by those sources in the LDRD program.

The total FY 2003 funding for the LDRD program conducted at the laboratories was approximately $356 million, which represents about 4 percent of the total laboratory costs at these laboratories. Of this amount, $243 million was provided by defense customers and $113 million by non-defense customers. A review of the LDRD program funding shows that about $268 million supports projects that will be expected to benefit the defense and national security missions, and $283 million supports projects that will be expected to benefit non-defense customer mission areas.

In assessing the return on the dollars invested in LDRD, it is essential to understand that the vast majority of research and development activities have application to national needs in both defense and non-defense arenas. That is, as the numbers above indicate, many of the LDRD projects are put in both categories since they support fundamental research and can be

expected to benefit both defense and non-defense missions. The clear implication is that the anticipated benefit of LDRD science and technology to defense and non-defense national needs will always exceed the relative contribution of funds from either source independently. This leveraging of the research capabilities of the DOE's multi-program laboratories is one of the great benefits of the LDRD program and its focus on the long-term vitality of the laboratories.

2.3 Workforce Development

Maintaining the vitality of the DOE multi-program National Laboratories—the overarching theme of the LDRD program—implies a responsibility not only for future-looking research and development but also for the workforce of the future. For the laboratories to be poised to tackle problems confronting DOE and the Nation it requires more than facilities and infrastructure. Scientists and engineers must also be available to implement the capabilities of the laboratories.

Post-doctoral appointments offer the single largest source of new scientific and engineering talent for the DOE laboratories and are therefore critical to maintaining institutional vitality. The LDRD program plays a central role in the various post-doctoral programs at all of the laboratories, as shown in Table III.

Table III. Postdocs supported by LDRD at the DOE Laboratories in FY 2003.

Laboratory	Total postdocs	Postdocs supported by LDRD	LDRD-supported fraction
ANL	203	50	25%
BNL	162	44	27%
INEEL	18	14	78%
LANL	499	278	56%
LBNL	235	60	25%
LLNL	143	100	70%
ORNL	231	64	28%
PNNL	206	64	31%
SNL	169	82	49%

In addition to this formal participation in post-doctoral programs, the LDRD program also supports a wide range of activities that enhance the laboratories workforce development. These include support for both undergraduate and graduate students working on LDRD projects, reputation building by providing laboratory visibility in a wider range of publication venues than would be the case without the results of LDRD, technical staff retention associated with opportunities to retain and hone scientific skills via LDRD, and a remarkable range of university collaborations stimulated via LDRD projects.

2.4 LDRD and the Work for Others Program

One of the major benefits the Nation derives from the DOE multi-program National Laboratories is the synergistic application of science and technology to a broad range of critical national security and science missions, through the DOE WFO program.

As mentioned above, the LDRD program is structured to pursue innovative and creative science and technology, often with an emphasis on projects that will contribute to the needs of multiple programs and Federal agencies. All WFO sponsors benefit from the strong science and technology base enhanced by LDRD. The Department views LDRD as a legitimate cost of doing business for all programs at the multi-program laboratories. Therefore, to ensure that all users of the laboratories support their fair share of LDRD innovations, the cost is included as an allocable cost. The pricing policy of DOE is full cost, which includes all direct costs incurred in performing the work, allocable cost incurred by DOE and its contractors at any Departmental facility in performing work on behalf of non-DOE entities, and a Federal administrative charge of 3 percent of these costs. LDRD is considered an allocable cost in accordance with the terms of the laboratory operating contract and is identified in the laboratory's accounting system.

These WFO programs are possible because the laboratories have developed unique research and development capabilities in a wide range of areas of relevance to organizations besides DOE. WFO customers seek out these capabilities and, in many cases, initiate WFO research and development at the laboratories. WFO research broadens the base of innovation at the DOE laboratories and increases the number of potential solutions to national challenges, including threats to national security. The laboratories' research results are enhanced by the cross-pollination of technologies developed in conjunction with its WFO partners.

In this regard, Congress provided language in the Conference Report accompanying the FY 2002 Energy and Water Development Appropriations Act that requires the Department to notify other Federal agencies that a portion of the funds collected through the WFO program will be used to fund LDRD projects. In addition, with the creation of the DHS, Congress enacted analogous requirements that LDRD funding associated with DHS programs be used to support DHS missions. As noted earlier, the Conference Report also requires the Secretary to affirm that all LDRD activities derived from funds of other agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the appropriation acts that provided funds to those agencies.

In response to the FY 2002 Conference Report, the Secretary issued guidance requiring all LDRD laboratories to notify other Federal agencies concerning LDRD charges. These procedures changed the WFO process to ensure proper notification of other Federal agencies as to the LDRD charges prior to funding work at the laboratory. Specifically, each new and/or revised WFO proposal provided to a Federal agency must indicate the amount of LDRD charges that will be collected. Furthermore, the proposal notifies the sponsor that, by

providing funding, the agency is acknowledging that LDRD activities are beneficial to their organization and consistent with appropriation acts providing funds to that agency. Subsequently, each WFO funding acceptance document also includes the LDRD estimate acknowledgement.

In February 2003, the Secretary of Energy and the Secretary of Homeland Security entered into a Memorandum of Agreement to implement key provisions of the Homeland Security Act. In addition, the Deputy Secretary of Energy issued a DOE Notice on *Reimbursable Work for the Department of Homeland Security*. The purpose of that document was to provide information on the process by which the DHS may place orders for reimbursable work activities to be performed at the DOE laboratories. Within that Notice, there are provisions for the notification of LDRD charges in the cost proposal as well as requirements for acknowledgements regarding the benefits of LDRD prior to final approval.

These policies have been implemented and provide a basis for the Secretary to affirm that the LDRD program is managed in accordance with the Congressional direction cited above. The Secretarial affirmation is included as Appendix 1. More recently, the DOE Acting Chief Financial Officer transmitted applicable guidance and policy to reiterate the process to other Federal agency Chief Financial Officers who are customers and sponsors of work at the Department's laboratories.

3. Report Conclusions

The DOE LDRD program offers a crucial mechanism by which the multi-program National Laboratories maintain their vitality and, in the process, prepare themselves to meet the Nation's future scientific and engineering challenges. In FY 2003, the multi-program National Laboratories devoted approximately $356 million to LDRD, funding projects ranging in size from less than $30,000 per year to over $2.5 million. LDRD projects address topics that span the entire range of DOE's broad scientific mandate. An analysis of LDRD investments compared to the sources of laboratory funding indicates the LDRD benefits are commensurate with the funding received from defense and non-defense sources. In addition, the Department affirms that all FY 2003 LDRD activities derived from funds of other Federal agencies have been conducted in a manner that support the science and technology development that benefit the programs of the sponsoring agencies and are consistent with the appropriations acts providing funds to those agencies.

An important component of the contribution of the program to the laboratories' future is their ability to attract promising young scientists and engineers to the institutions. LDRD funded post-doctoral appointments, for example, supported over 40 percent of all post-doctoral scientists and engineers at the multi-program National Laboratories in FY 2003. In addition, many graduate students participate in LDRD projects, and the programs provide a mechanism for scientists and engineers at the laboratories to keep themselves current in their fields.

The LDRD program is essential to maintaining the vitality of the laboratories that support the Department's missions and national needs. We have carefully reviewed the management and administrative procedures and funding levels at each of the laboratories and will continue to maintain a strong and vital LDRD program at the laboratories.

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Project List -- Fiscal Year 2003

ANL - Argonne National Lab

Project ID	Project Name	Total
P/ANL2000-217-R3D	Photoprocesses in Hybrid Nanostructures: Fundamental Interaction/Communication Mechanisms between Nanodomains	$232,480
P/ANL2000-217-R3G	Synthesis and Properties of Cluster-Based Nanoparticles and Assemblies	$83,098
P/ANL2000-217-R3I	Charge Trapping Free Electrons and Photocatalysis in Aqueous TiO2 Nanoparticles	$90,536
P/ANL2001-008-R2	Improvement of Coated Gallium Arsenide Fast-Neutron Detectors	$62,982
P/ANL2001-087-R2	High Fidelity Modeling of the Human Spine on Parallel Computing Platforms	$74,889
P/ANL2001-111-R2	Processing and Magnetic Manipulation of Layered Particles for Novel Cancer Treatment Applications	$149,303
P/ANL2001-133-R2	Gas Phase Decontamination Technology for Sensitive Equipment	$97,997
P/ANL2001-143-R2	X-Ray-Based Engine Research: Fuel Spray and Combustion Experiments in a Static Pressure Vessel with X-Ray Transparent Windows	$147,630
P/ANL2001-144-R2	X-Ray-Based Engine Research: Numerical Simulation of Internal Combustion Engine Sprays	$149,809
P/ANL2001-145-R2	X-Ray-Based Engine Research: Soot Formation	$148,570
P/ANL2001-149-R2A	Predicting Structure from Sequence	$387,222
P/ANL2001-149-R2B	Mapping Protein-Ligand Interactions (Combinatorics)	$399,098
P/ANL2001-149-R2D	Membrane Proteins - Technologies for Comprehensive Functional Characterization	$98,487
P/ANL2001-164-R2	Sensor Guided Semi-Automatic Teleoperation for RFT and D&D	$30,047
P/ANL2001-207-R2	Cavity-Ring-Down Sensor for Monitoring Oxidants in Cardiac Arrest Patients	$47,892
P/ANL2001-221-R2	Evaluation of Innovative Features for the Advanced Fast Reactor (new title)	$542,117
P/ANL2002-001-R1	Laser-Based Ignition System for Natural Gas Reciprocating Engines	$208,916
P/ANL2002-005-R1	A New Process for the Removal of Hazardous Organic Compounds from Contaminated Groundwater using an Environmentally Friendly Solvent Extraction Technology	$122,745
P/ANL2002-006-R1	Support Vector Machine Algorithms to Merge Protein Structural Analysis and Machine Learning	$139,443
P/ANL2002-010-R1	Computational Modeling of Clay-Polymer Nanocomposite Membranes	$149,339
P/ANL2002-017-R1	Magnetically Stabilized Metal Clusters	$87,828
P/ANL2002-018-R1	New Photonic Materials Based on the Self-Assembly of Nano-Structured Metallo-Organic Building Blocks	$137,738
P/ANL2002-034-R1	Band Gap Engineering of Transparent Conducting Oxides	$161,421
P/ANL2002-036-R1	Molten Oxide Electrolysis: A Basis for Carbon-Free Steel Production	$134,806

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ANL - Argonne National Lab

Project ID	Project Name	Total
P/ANL2002-050-R1	Designer Nanocomposites for Hydrogen Storage	$76,129
P/ANL2002-068-R1	Spin Polarized Nanostructures at Interfaces of Superconductors and Diluted Magnetic Semiconductors: New Prospects for Tunable Quantum Dot Arrays	$78,920
P/ANL2002-085-R1	Trace Measurement of DNA Adducts by VUV Soft Ionization	$80,473
P/ANL2002-096-R1	Extra Space-Time Dimensions	$60,424
P/ANL2002-099-R1	Advanced Biological Sensors Based on Fluorescent Conjugated Polymers	$85,362
P/ANL2002-109-R1	Development of Anodes for Actinide Electrolysis	$29,967
P/ANL2002-113-R1	Development of an Out-of-Pile Liquid Metal Experiment Capability to Support AFR-300 Design and Safety Analysis	$3,284
P/ANL2002-115-R1	Core Configuration Adaptation to Fuel Cycle Missions with Superior Passive Safety Performance (new title)	$274,749
P/ANL2002-116-R1	Assessment and Development of Thermal Hydraulic, System Design, and Integrated Safety Analysis Capabilities for Advanced Fast Reactors	$19,941
P/ANL2002-135-R1	Improved Capabilities for Determining Test Fuel Power and Motions in TREAT	$1,664
P/ANL2002-147-R1	A Calorimeter for the Linear Collider Detector	$150,037
P/ANL2002-149-R1	Derivatization of Ultrananocrystalline Diamond for Bioassays	$90,208
P/ANL2002-152-R1	Petascale Experimental Research (PXR)	$1,119,098
P/ANL2002-153-R1	Prokaryotic Simulation System: Computational Biology and Bioinformatics -- The Science Drivers for PXRF	$1,008,442
P/ANL2002-154-R1B	Computational Science for Self-Assembly	$90,968
P/ANL2002-161-R1	Environmental Decision Making Technology R&D	$99,971
P/ANL2002-163-R1	Capabilities Development for the Analysis of Complex Adaptive Systems	$261,565
P/ANL2002-185-R1	Nano-Bio Composite Structures	$192,138
P/ANL2002-186-R1	Nanophotonics	$203,271
P/ANL2002-187-R1	Quantum Materials	$200,375
P/ANL2002-188-R1	Adaptive Nanoscale Self-Assembly	$200,392
P/ANL2002-192-R1	Development of Nanofabrication Techniques using Advanced Lithography	$290,246
P/ANL2002-193-R1	Development of Instrumentation for the Spallation Neutron Source (SNS)	$204,200
P/ANL2002-194-R1	Surface Spin Polarization for Spintronics	$75,494
P/ANL2002-195-R1	Catalytic Destruction of Chemical Threats in Human Occupied Spaces	$49,715
P/ANL2002-196-R1	Hybrid and Patterned Nanomagnetic Systems	$300,353
P/ANL2002-199-R1	Nanoscale Multiferroics for Coupled Magnetic and Ferroelectric Functionality	$79,786

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ANL - Argonne National Lab

Project ID	Project Name	Total
P/ANL2002-200-R1	Nanoscience and Biomineralization	$78,331
P/ANL2002-201-R1	Synthesis and Physical Properties of Functionalized Diblock Copolymers and Magnetic Nanocrystal Arrays (new title)	$71,999
P/ANL2002-202-R1	UHV STM for Self-Assembled Magnetic Nanowires	$50,256
P/ANL2002-203-R1	Fabrication of Nanowires with Anodized Aluminum Oxide	$50,703
P/ANL2002-204-R1	Imaging of Nanoscale Vortex States in Superconductors by Scanning Tunneling Spectroscopy	$50,550
P/ANL2002-205-R1	Surface Functionalization of Ultrananocrystalline Diamond Thin Films	$78,301
P/ANL2002-206-R1	Counter Terrorism Application of Agent Based Simulation	$80,542
P/ANL2002-210-R1	Innovative Strategy of Biotoxin Removal from Exposed Humans: Magnetic Nanoparticle Sequestration and Dialysis	$189,426
P/ANL2002-211-R1	Interacting Laterally Patterned Magnetic Structures	$200,848
P/ANL2002-212-R1	Thermal Transport in Nanostructures and Nanocomposites	$78,149
P/ANL2002-213-R1	Self-Assembly and Self-Organization of Nanostructures by Multiscale Materials Simulation	$74,722
P/ANL2002-216-R1	Ozone and Aerosols in Metropolitan Chicago: Land-Lake Breeze Effects	$77,402
P/ANL2003-010-N0	Preparation and Crystallization of Membrane Proteins, MerC and MerT Involved in Bacterial Mercuric Ion Detoxification	$79,704
P/ANL2003-040-N0	Vortex Cellular Automata: Computing with Superconducting Vortices in Nanoscale Devices	$90,385
P/ANL2003-053-N0	Development of Analytical Capabilities for Nuclear Forensic Applications	$102,322
P/ANL2003-064-N0	Bio/Inorganic Hybrid Arrays for Photovoltaic Cells and Biological Sensors	$134,910
P/ANL2003-073-N0	The Control of Shape, Size, and Reactivity of Metal Oxide Nanoparticles	$123,060
P/ANL2003-080-N0	Laser Trapping and Cooling of Radium-225	$86,635
P/ANL2003-087-N0	Development of Surface Treatments for Ultra High Gradient Accelerator Cavities	$144,243
P/ANL2003-103-N0	Fluxoid Manipulation by Josephson Vortices: New Opportunity for Vortex Logic	$85,785
P/ANL2003-105-N0	Ultrafast Spectroscopy, Combining Lasers and X-Rays	$116,929
P/ANL2003-106-N0	Metabolome Analysis from Aptamer Biochips	$141,105
P/ANL2003-117-N0	Quantized Magneto-Catalysis of Electron Transfer Reactions	$79,453
P/ANL2003-119-N0	Tunable Terahertz Sources	$145,942
P/ANL2003-124-N0	Development of Polysiloxane-Based Solid Electrolytes for Lithium Batteries	$135,847

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ANL - Argonne National Lab

Project ID	Project Name	Total
P/ANL2003-128-N0	Novel Thin-Film Diamond Electronics	$100,380
P/ANL2003-146-N0	Synthesis of High Temperature Superconductor Wires using Novel Atomic Layer Deposition Synthesis	$146,190
P/ANL2003-151-N0	Time-Resolved X-Tomography of Highly Transient Fuel Sprays	$121,777
P/ANL2003-154-N0	Production of Hydrogen Gas from Hydrogen Sulfide	$144,960
P/ANL2003-158-N0	High-Sensitivity Infrared Imagers for Environmental and Energy Security/Safety Monitoring	$80,610
P/ANL2003-164-N0	Development of High Density, High Thermal Conductivity Uranium Carbide for Efficient ISOL Targets	$90,391
P/ANL2003-172-N0	Mass Spectral Detection of Biomolecular Interactions on a Functional Proteomic Biochip	$199,555
P/ANL2003-173-N0	Functional Genomics of Endothelial Cell Tube Formation	$285,697
P/ANL2003-175-N0	Structural Genomics of Microbial Pathogens	$188,889
P/ANL2003-176-N0	Designer Antibodies and Interaction Mapping	$899,880
P/ANL2003-177-N0	Nano-Architecture from the Bio-System: Fabrication, Assembly and Function	$281,389
P/ANL2003-180-N0	Testing of a Model 345 MHz Fast Tuner for the RIA Driver Linac	$49,838
P/ANL2003-181-N0	Isobaric Mass Separation and the Beam Properties Extracted from a RIA Type Gas Catcher	$108,995
P/ANL2003-184-N0	Advanced Carbon Coatings for Invasive and Implantable Medical Devices	$45,354
P/ANL2003-185-N0	High-Power Beam Dump for a Large Acceptance RIA Fragment Separator	$61,263
P/ANL2003-188-N0	Development of a Model 3-Spoke Superconducting Resonator for RIA	$552,620
P/ANL2003-196-N0	Tradeoff Studies for Recycle Economics	$148,287
P/ANL2003-204-N0	Lightweight and Robust Hydrogen Storage Materials for Automotive Fuel Cells	$150,822
P/ANL2003-216-N0	Linear Collider R&D at Argonne: High Gradient Accelerating Structures	$321,961
P/ANL2003-217-N0	Linear Collider R&D at Argonne: High-Brightness Electron Sources	$216,516
P/ANL2003-218-N0	Linear Collider R&D at Argonne: Damping Wigglers	$29,615
P/ANL2003-219-N0	Investigations of the Effect of the Biogeochemical Cycling of Iron on the Fate and Transport of Heavy Metal, Radionuclide, and Organic Contaminants	$498,778
P/ANL2003-224-N0	Separative Bioreactor Model: Using pH-Controlled Electrodeionization	$178,977
P/ANL2003-230-N0	Demonstrate the Two-Charge State Injector Concept for the RIA Driver Linac	$237,724
P/ANL2003-234-N0	Analysis and Development of Liquid Metal Targets for RIA	$99,617
P/ANL2003-235-N0	Analysis and Mitigation Methods for Electrical Arc Injuries in Medical Environment	$92,125

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ANL - Argonne National Lab

Project ID	Project Name	Total
P/ANL2003-236-N0	Demonstration of a Full Power Test Model of the 12 MHz Hybrid-RFQ for Acceleration of Radioactive Ions with Charge-to-Mass Ratio 1/240	$245,015
P/ANL2003-237-N0	Study of Beam Halo Formation in Longitudinal Phase Space in the RIA Driver Linac	$389,688
P/ANL2003-242-N0	Demonstration of Transmission Multilayer Optics for Sub-Ten-Nanometer Focusing of Hard X-Rays	$175,505
P/ANL2003-256-N0	Development Toward a VUV FEL at the APS	$317,216
P/ANL2003-273-N0	Development of Fuels for Fast Spectrum Gas-Cooled Reactors	$72,817
P/ANL2003-276-N0	Evaluation of Core Materials for Gas-Cooled Fast Spectrum Reactors	$49,081
P/ANL2003-282-N0	Concept Development for RIA Lithium Thin-Film Stripper Formation and Primary Cooling of the High Power Density Neutron Converter	$89,974
P/ANL2003-288-N0	Demonstration and Characterization of Thin-Film Liquid Lithium Stripper for the RIA Driver Linac	$640,888
P/ANL2003-291-N0	Environmental and Performance Benefits for a Geologic Repository from the Removal of Actinides from Spent Nuclear Fuel and Recycling in a Fast Neutron System	$249,185
P/ANL2003-304-N0	Safety Technology for Gas Cooled Fast Reactors	$116,914
P/ANL2003-323-N0	Developing X-Ray Transparent Windows Sustainable to Dynamic High-Pressure and High-Temperature for Imaging Applications at the APS	$125,879
P/ANL2003-325-N0	Fuel Cycle Strategy and Cost Modeling Development and Evaluation	$298,596
P/ANL2003-326-N0	Advanced Fast Reactor - System Integration and Concept Development	$196,998
P/ANL2003-327-N0	Investigation of Power-Flow Instability Phenomena in SCWR Designs	$92,973
P/ANL2003-328-N0	Investigation of Passive Safety Features for SCWRs	$67,391
P/ANL2003-329-N0	Hydrogen Production from Low Temperature Thermochemical Cycles Compatible with Heat from a Na-Cooled Nuclear Reactor	$296,707
P/ANL2003-330-N0	Strategic Analysis of Recycle Technologies Deployment	$74,441
P/ANL2003-331-N0	Process and Equipment Integration in a Recycle Facility	$302,874
P/ANL2003-332-N0	Integration of Automated Systems and Robotics for a Recycle Facility	$71,963
P/ANL2003-333-N0	Research on Remote Fuel Fabrication Technology for Generation IV Fuel Cycles	$224,969
P/ANL2003-334-N0	Assessment of Pyroprocessing Structural Materials for Experimental Testing	$166,563
P/ANL2003-335-N0	Experimental Testing of Pyroprocessing Structural Materials	$254,513
P/ANL2003-336-N0	Multidisciplinary Theory	$262,016

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ANL - Argonne National Lab

Project ID	Project Name	Total
P/ANL2003-337-N0	The Use of Synchrotron and Terahertz Radiation Sources for Homeland Security	$157,495
P/ANL2003-338-N0	Modeling Near-Field Atmospheric Dispersion and the Potential Health and Economic Impacts from Terrorism Scenarios Involving "Dirty Bombs" or Similar Devices	$154,704
P/ANL2003-340-N0	Core-Shell Nanocrystal Spring Magnets	$162,922
P/ANL2003-341-N0	Simulation and Modeling of Reactivity in Nanoporous Materials	$70,192

Total # of Projects for ANL: 129 **Total Cost for ANL: $22,418,803**

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BNL - Brookhaven National Lab

Project ID	Project Name	Total
01-013	'Functional Spectral Signature' (FSS) Method for Signal to Noise-Enhancement of Brain Patterns in PET Images	$41,383
01-030	Development of CZT Array Detector Technology for Synchrotron Radiation Applications	$50,418
01-031	New Applications of Circular Polarized VUV-light (NANO IV)	$51,191
01-035	Prototype Approaches for Infrared Nanospectroscopy	$43,818
01-036	Pressure-Induced Protein Folding Monitored by Small Angle X-Ray Scattering and Fourier Transform Infrared Microspectroscopy	$49,620
01-038	Soft Condensed Matter Probed by Low-energy Resonant Scattering	$49,422
01-039	Femto-Second Transmission Electron Microscope Based on Photocathode RF Gun	$64,622
01-051	Human DNA Damage Responses: DNA-PK and p53	$61,706
01-087	Charge Transfer on the Nano Scale: Theory (NANO III)	$17,512
01-093	High Resolution Magneto-optical Study of Magnetic Nanostructures, Nanocomposite functional and Superconducting Materials (NANO IV)	$26,000
02-002	Crystallization and X-ray Analysis of Membrane Proteins	$396,551
02-003	In Vitro Investigation of the DNA Double Strand Break Repair Mechanism by Non-Homologous End-Joining in the context of Chromatin	$61,070
02-008	Creating a MicroMRI Facility for Research and Development	$193,613
02-009	Targeting Tin-117m to Estrogen Receptors for Breast Cancer Therapy	$98,671
02-016	Biomineralization of Actinides: A Mechanistic Study of the Microbial Genesis of Novel and Stable Compounds	$92,482
02-017	Using Mini CO2-DIAL for Verification and Long-Term Monitoring of Cover Systems	$124,084
02-022	Electrical Systems Reliability	$99,081
02-024	Liquid Fuel Gasifier for Combustion and Fuel Cells	$107,892
02-031	Study of a Power Source for Nano-Devices	$99,045
02-042	Ultrafast Nonlinear Spectroscopic Studies of Model Catalytic Surfaces	$185,275
02-045	Combined Use of Radiotracers and Positron Emission Imaging in Understanding the Integrated Response of Plants to Environmental Stress	$99,809
02-046	Arranging Nanoparticles into Arbitrary Patterns with Optical Trapping	$119,807
02-048	Advanced Multidimensional Techniques to Explore the Biochemical and Behavioral Consequences of VOC Exposure	$94,788

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BNL - Brookhaven National Lab

Project ID	Project Name	Total
02-049	Project to Detect pp and 7Be Solar Neutrinos in Real Time: LENS, the Low-Energy Neutrino Spectrometer	$70,006
02-053	Combined Theoretical and Experimental Study of Crystal Lattice Defects in Complex Transition Metal Oxides	$65,745
02-055	Chemical Sensors: Immobilization of Organometallic Complexes into Sol-gel Matrices	$84,607
02-056	Size Dependence of Catalytic Reactivity of Iron Oxide Nanocrystals	$104,354
02-058	Femtosecond Synchronization for Ultra-Short Pulse DUV-FEL Radiation	$134,776
02-062	Rapid Wavelength Tunability for the DUV-FEL	$135,269
02-066	High-Gain Harmonic-Generation at the DUV/FEL	$134,612
02-067	Biomineralization: A Route to Advanced Materials	$103,076
02-070	Theory of Electronic Transport in Nanostructures and Low-Dimensional Systems	$110,055
02-071	Pressure in Nanopores	$72,856
02-084a	Genomic Selex to study Protein DNA/RNA Interactions in Ralstonia metallidurans CH34 Regulating Heavy Metal Homeostasis and Resistance	$167,824
02-084b	Lead Resistance in Ralstonia metallidurans CH34	$168,766
02-085	Design of a Ralstonia mettallidurans Two-Hybrid Protein System for Studying Signaling Pathways Regulating Heavy Metal Homeostatis and Resistance	$172,175
02-086	Ultrafast X-Ray Science	$107,670
02-088	X-Ray Photon Correlation Spectroscopy Studies of Nanostructured Block Copolymers	$104,806
02-091	Fine-Grain Gas and Silicon Detectors for Future Experiments in Nuclear Physics at High Energies	$96,559
03-004	High-Brightness, High-Power Electron Beams	$149,624
03-006	Feasibility Study of Optical Stochastic Cooling with a CO2 Laser	$109,205
03-013	Proposal for Niobium/Tin Superconducting Magnet	$147,824
03-014	Technology Development for Linear Collider Final Focus Quadrupoles with Small-Aperture High-Gradient Superconducting Coils	$124,829
03-025	Real-Time Detection and Multi-Dimensional Characterization of Single Air-Borne Microorganism	$99,570
03-026	Developing a New, Unified Systems Theory on Size Distributions of Atmospheric Particles	$45,495

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BNL - Brookhaven National Lab

Project ID	Project Name	Total
03-027	Measurement of HO2 Radicals by ChemiLuminescence Analysis of Atmospheric Radicals (CLAAR)	$99,480
03-030	Chemistry of the Rhizosphere	$99,360
03-039	Integrated Analysis of Carbon and Nitrogen Metabolism in Plants and Subsequent Analysis of Photosynthetic Acclimation to Growth in Elevated pCO2	$65,782
03-050	Evaluation of High-Energy Radiation Effects in Materials	$98,424
03-056	Structural Properties of Methane Hydrates	$83,870
03-061	Dynamics of Wind Turbine-Tower-Foundation Systems	$138,302
03-064	Investigation of Neutron and Gamma Probes to Detect Explosives in Sealed Containers	$108,782
03-065	Ultrasound and Infrared Imaging to Detect Degradation of Electric Cable Insulation	$61,439
03-072	Application of Compton-Suppression Gamma Spectrometry to Problems in Anti-Terrorism	$122,783
03-077	Real-Time Consequence Assessment System for Atmospheric Terrorist Events in the Northeast Urban Corridor	$69,765
03-081	Application of Thin Film-Like Dosimeters for Port Security and Anti-Terrorism	$109,079
03-083	Novel Xenon Detector Concepts for Homeland Defense	$99,029
03-086	Defining New Pathways for Disarming Anthrax Toxin	$99,955
03-094	Structural Studies on the Integral Membrane Protein AlkB	$52,754
03-098	Roles of Dopamine Receptor Agonists in Brain Metastasis of Breast Cancer	$97,812
03-099	The microPET Study of Gene Expression in Rodents	$46,629
03-100	Investigation of the "Early Response" in Functional MRI	$231,159
03-101	PET Imaging of Violent Behavior	$95,168
03-103	PET Study of Acetaldehyde Distribution and Metabolism to Better Understand Alcohol Related Diseases	$99,469
03-104	Hydrogen Atom Transfer from Carbon to Metal - Relevance of a Novel Reaction to Catalyzed Hydrocarbon Conversions	$19,643
03-105	Radioprotection in D. Radiodurans, a Radiation Resistant Bacterium	$57,100
03-107	New Development of Norepinephrine Transporter Radioligands for PET Studies of Substance Abuse, Depression and ADHD	$112,074
03-108	Experiments in the Short-Wavelength Regime Pertinent to the DUV-FEL Concept	$132,731

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BNL - Brookhaven National Lab

Project ID	Project Name	Total
03-115	Imaging Tandem Mass Spectrometry for High-Throughput "Fingerprint" Detection of Complex Molecules in Mixtures	$112,241
03-118	Condition: Green Chemistry Radiolytic Studies of Ionic Liquids in Service of Security and the Environment	$42,416
03-119	Exploring the Use of Powder Diffraction for Proteins	$44,700
03-121	Element-Resolved Dynamics of Nanoscale Ferromagnets	$28,641
03-122	Membrane Biophysics Using Single-Layered Lipid Membrane	$29,571
03-127	High Pressure in Strongly Correlated Materials - An Optical Investigation	$53,679
03-129	Polyoxometalate Giant Molecules: Novel Synthetic Methods, Characterizations and Potential Applications	$54,426
03-131	Continuous Spallation Neutron Source	$5,192
03-135	Exploratory Sol-Gel Synthesis Routes for Perovskite Nanorods and Dots	$63,285
03-137	In Situ Soft X-Ray Absorption Spectroscopy Studies of Cathode Materials for Thin Film Lithium-Ion Batteries	$75,354
03-138	Functional Bulk Mn-Based Nanocomposites	$27,917
03-144	Nanostructured Transition Metal Oxides	$39,172
03-151	Radio Wave Detection of Ultra High Energy Cosmic Rays	$99,914
03-161	Generation of Coherent, Femtosecond, High Brightness VUV and X-Ray Using High Order Harmonic Conversion	$129,593
03-162	New Synthesis Techniques to Control Atomic Defects in Advanced Intermetallic Compounds	$85,825

Total # of Projects for BNL: 83 **Total Cost for BNL: $7,830,078**

INEEL - Idaho National Engineering and Environmental Lab

Project ID	Project Name	Total
AC101	Parallel Computing with Cluster Technology	$327,759
AC102	Improving Numerical Model Efficiency of a Simulation Model	$97,045
AC103	Aerospace Situation Awareness and Risk Monitor Tool	$95,245
AC104	Development and Validation of Advanced Simulation and Collaboration Capability	$170,002
CE108	Genetic Control of Straw Stem Ultrastructure that Affects the Biomechanics of Stem Separation.	$201,105
CE109	Computational Fluid Dynamics Model Based Control of Two-Phase Flow	$120,526
CE110	Development of Analytical Decision-making Tools for Energy Efficient Agricultural Biomass Production	$97,993
CE111	Stable Enzymes for Hemicellulose Hydrolysis	$136,678
CE112	Pretreatment Technologies for Cellulosic Biomass	$139,469
CE113	Flow Characterization of Complex Biomass Flows for Bioenergy Feedstock Development	$49,486
CS114	Critical Infrastructure, Critical Subnetwork	$324,901
CS117	Development of a Compact Laser-Compton X-ray Source	$177,925
CS118	Advanced Automated Ion Mobility Spectrometer for Explosives Detection	$178,135
ES101	Cermet Filters for Hazardous Material, Chemical and Biological Agent Destruction	$356,601
ET105	Biologically Based Catalysts for Processing and Detection in Harsh Service Conditions	$216,354
ET106	Exploration of Support Frameworks for Sustainable Clean-Up Decisions	$134,590
ET107	Recombinant Adhesive Protein Production and Investigation into Alternate Natural Adhesive Systems in Marine Mussels	$99,649
ET108	Improving Stakeholder Interactions: A Stakeholder-based Research Methodology for Reaching Decisions on Polarized Issues	$94,148
ET110	Elemental Tracers and Multi-Variate Receptor Modeling Methods in Assessing Air Pollution	$112,826
ET114	Use of Engineered Nano-Particles for Nutrient Delivery and Bioremediation in Subsurface Environments	$128,037
ET116	Advanced Control Architectures for Human-Robot Synergy in Complex, Multi-Operation Domains	$224,859
ET117	Model-Based Decision Making: Conceptual Framework and Environmental-Related Application Development	$74,640
ET118	Intelligent Control of Multi Nodal Systems	$98,602

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INEEL - Idaho National Engineering and Environmental Lab

Project ID	Project Name	Total
ET119	Understanding Societal Issues Associated with Acceptance of Bioremediation Strategies	$45,509
ET120	A Research-Centered and Performance-Based Approach to Advanced Emergency Response Planning Support System Design	$47,474
ET121	Human Factors for Management of High Consequence Events	$60,866
ET122	Developing the Scientific Basis for Landscape Level Management of Federal Facilities	$40,309
GC101	Fundamental Studies on Gas Contaminant Mobility in the Vadose Zone from Atmospheric Pressure Fluctuations	$135,256
GC102	Regional Setting and Flow Dynamics of the Snake River Plain Aquifer	$275,155
GC105	Advanced Borehole Seismic Sources for High-Resolution Subsurface Imaging and Characterization for Environmental Applications	$345,395
GC106	Enhanced Techniques for Evaluating Colloidal Transport Processes	$203,477
GC108	Advanced Technology for Mapping Subsurface Water Conductivity	$185,320
GC109	Development of Enzymatic Biosensors for Environmental Applications	$159,242
GC111	Hybrid Nanocomposite Materials as Subsurface Permeable Reactive Barriers	$287,069
GC114	Kinetics and Mechanisms of Inter-Surface Transfer, and Solid-Solution Partitioning, of Surface-Complexed Metals in Colloidal Systems	$123,232
GC116	Organic Co-Solvent and Co-Contaminant Effects on Soprtion of Uranyl and Cesium to Metal Oxide Surfaces	$124,019
GC117	Evaluating Microelectrodes and Fiber-Optic Probes for use in Meso-Scale Experiments	$188,450
GC119	Development of Imaging Fourier Transform Mass Spectrometer Capabilities for Analyses of Complex & Heterogeneous Samples	$332,959
GC124	Use of Molecular Markers for Detection and Tracking of Environmental Bacteria	$99,826
GC125	Natural and Synthetic Subsurface Colloids	$243,321
GC130	Development of Techniques for In Situ Measurement of Groundwater Contaminant Source Strength	$144,994
GC131	Characterizing Microbial Population Shifts in Response to Alternative Electron Donors and their Effect on Trichloroethylene Dexhlorination Efficiency	$158,830
GC133	Electrical Resistivity Imaging to Define Preferred Flow Paths in a Heterogeneous Layered Vadose Zone	$79,388
GC134	Development and Application of Custom Flow Models for Understanding Flow in Porous and Fractured Matrices with Biological Components	$212,459

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INEEL - Idaho National Engineering and Environmental Lab

Project ID	Project Name	Total
GC135	Investigation of the Movement and Fate of Chlorinated Hydrocarbons	$337,852
GC136	Modeling of flow and colloid behavior in subsurface fractures	$288,118
GC138	Application of New Borehole Geophysical Methods for Stratigraphic Correlation and Identification of Non-Aqueous-Phase Contaminants	$115,235
GC140	Computational Experiments of Hysteretic Chemical and Moisture Migration	$307,156
GC141	Calibration and Enhancement of Geophysical Imaging Tools in a Mesoscale Experimental Facility	$465,020
GC144	Characterization of Nonlinear Complex Resistivity Spectra During Biochemical Reduction of Cr+6 to Cr+3	$142,021
GC145	Dual Electrodes and Defining the Electrically Disturbed Region in Induced Polarization Measurements	$138,709
GC147	Use of Genetic Markers for Ecological Risk Assessment	$217,459
GC149	Uptake and Translocation Patterns of Strontium by Sagebrush Steppe Ecosystem Plants	$99,951
GC150	Multiscale Modeling of Multiphase (Unsaturated) Flow	$92,114
GC151	Modeling Solute Partitioning at Interfaces	$109,335
GC152	Estimating the Climatic Sensitivity of Vadose Zone Infiltration Rates through Paleohydrologic Analyses	$67,330
GE101	The Modular Pebble-Bed Reactor	$220,744
GE102	Advanced Transient Analysis Capabilities for the Next Generation Nuclear Reactors	$204,551
GE103	Gas-Cooled Reactor System Analysis Tools	$160,292
GE104	Advanced Nuclear Fuels for Enhanced Proliferation Resistance	$233,503
GE105	Design of an Actinide Burning, Lead or Lead-Bismuth Cooled Reactor That Produces Low Cost Electricity	$406,907
GE107	An Innovative Gas-Cooled Fast Reactor	$546,285
GE108	Advanced Fission Product Detection Systems for the Next Generation Nuclear Reactors	$184,024
NC101	Nanostructure Characterization for Sensing	$107,466
NC103	Enhanced Transport in Nanocrystalline Ceramic Films	$114,041
NC104	Nucleation and Growth of Nanoparticle Materials in Supercritical Fluid Processes	$102,587
NE108	Two-Phase Mass Flow Measurement for Geothermal Wells	$54,957

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INEEL - Idaho National Engineering and Environmental Lab

Project ID	Project Name	Total
NE111	Friction Stir Welding of Lightweight Materials for Automotive and Transportation Systems	$146,131
NE114	Energy Efficient Building Simulation and Technologies	$148,209
NE117	Active Neutron Spectrometry for Neutron Capture Beam Characterization	$31,805
NE118	Laser Ultrasonic Corrosion Monitor	$353,262
NE119	Advanced Test Reactor Three Dimensional Neutronics Modeling	$160,113
NE120	Hydrogen Production from High Temperature Nuclear Reactors	$433,110
NE121	Laboratory Study and Model Development of Oil Shale and Other High Surface Area Sorbents for Capture of Sulfur, Chlorine, and Mercury Pollutants	$234,687
NE125	Hydrogen Technologies	$172,120
NE126	Hollow Waveguide Laser Ultrasonics for High Radiation Environments	$141,616
NE127	Estimation of Neutron Irradiation-Induced Displacements-Per-Atom	$93,412
NE128	Energy-Dispersive, X-Ray Flourescence Excitation Source for In-Field Analysis	$59,529
NE129	Radiation Chemistry of Supercritical Water	$46,400
NS102	Selected Release of Polymer Degradation Agents by Photoinitiation	$38,166
NS118	Novel Selective Matrix for Collection and Identification of Priority Pathogens	$99,958
NS121	Imaging Applications of Photon Beams Produced with Compton Backscatter of Laser Beams	$110,088
NS124	Microantenna Infrared Tags	$139,834
NS125	Mechanisms of Liquid Metal Embrittlement in Steels	$22,597
NS129	Mechanical, Physical and Metalurgical Factors Affecting Liquid-Metal Embrittlement of Steels	$18,723
NS132	Automated Control and Electronic Signal Acquisition/processing Systems for Sprayed Distributed Sensors	$123,232
NS133	Novel Fabrication of Blast and Penetration Resistant Materials	$149,432
NS134	Enhanced Isotope Ratio Measurement Sensitivity	$151,723
NS135	Smart Antenna Systems in a Wiresless Local Area Network	$256,885
NS136	Client/Server Architecture For High-Performance Computing	$265,333
NS137	Security of Cyber Systems	$262,558
NS138	Development of Enzyme-Activity-Based Assays for Potential Bioterrorist Agents Designed for use with Current Detection Platforms	$94,758
NS139	Novel Threat-Risk Index Using Probabilistic Risk Assessment and Human Reliability Analysis	$242,751

INEEL - Idaho National Engineering and Environmental Lab

Project ID	Project Name	Total
NS140	Wireless Security Research	$219,598
NS141	Thermomechanical Processing of Titanium 10V-2Al-3FE	$36,119
PH101	In-situ Vadose Zone Bioremediation of Explosives	$152,715
PH102	Characterization of Legacy Risk	$175,626
PH103	Residual Hazards Management: Decisions Leading Toward Success or Failure?	$162,748
PH104	Modeling an Earth Borehole System for Physical Property Determination in Shallow Subsurface Environments with Emphasis on Vadose Zone Applications.	$127,775
PH105	Improving Soil Water Flux Estimates in the Deep Vadose Zone	$140,030
PH106	A New Hydrogeophysical Method for Characterizing and Monitoring Preferential Flow Paths in Complex Layered and Fractured Basalt	$134,387
PH107	Dependence of Coal Bed Permeability on Pore Pressure and Adsorbed Gas Content	$165,180
SC111	Elucidating the Photo-Physics of Complex Metal Ions Trapped in a Fourier Transform Mass Spectrometer	$78,828
SC112	Mechanical and Flow Properties of Dry Granular Media	$92,965
SC115	The Controlled Synthesis, Structural, Electrical, and Optical Properties of One-Dimensional Metals	$32,399
SC116	Supercritical Fluid Catalyst Regeneration Chemistry	$142,517
SC117	Atmospheric Pressure Surface Analysis Mass Spectrometry	$144,865
SC118	Surface-Sensitive Laser Acoustic Studies of Heterogeneous Catalysis	$121,386
SC119	Development of Microelectrode Arrays for In Situ Detection of Localized Corrosion	$148,194
SC120	Advanced Materials for Power Generation	$98,800
ST105	Development of an Integrated Watershed Information Management Tool for Long-term Facilities Stewardship	$230,253
ST106	Integrated Environmental Analysis: Development of Collaborative Approaches to Long Term Environmental Stewardship	$185,915
ST107	DOE Complex - Wide Long-term Stewardship Options Analysis System	$156,809
ST108	Long Term Record Storage for Long Term Stewardship	$71,545
WT101	Cold-Crucible Design Parameters for Next Generation High Level Waste Melters	$146,558
WT107	Direct Dissolution of Plutonium and Neptunium Species Using Chelated Agents in Carbon Dioxide	$46,498
WT111	Thermodynamic Modeling of High-Ionic Non-Ideal Solutions	$122,044

INEEL - Idaho National Engineering and Environmental Lab

Project ID	Project Name	Total
WT112	Electrochemical Recovery of Mercury from Process Solutions	$48,706
WT113	Highly Selective Sorbents for Removal of Arsenic from Drinking Water	$170,362
WT114	Investigation and Modeling of Dynamic Strain Rate Effects on Structural Material Response	$57,319
WT115	Thermally Hot Offgas Cleanup Sorbent Technology Development	$114,235
WT116	Development of Advanced Aqueous Processing to Support the Nuclear Fuel Cycle	$155,675
WT117	Novel Abrasion Resistant, Enhanced Flux Ultrafiltration Membranes	$72,277

Total # of Projects for INEEL: 123 **Total Cost for INEEL: $19,613,542**

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KCP - Kansas City Plant

Project ID	Project Name	Total
KC01002-(703501)	Fiber Optic Chemical Sensors	$10,588
KC01005-(703504)	Modeling of Electromagnetic Radiation (EMR)/Electromagnetic Pulse (EMP) Proof Enclosures	$414
KC01006-(703505)	Evaluation of Piezoelectric Actuators for Microstronglink Applications	$56,365
KC01010-(703509)	Corrosion Evaluation of Plastic Encapsulated Microcircuits	$67,992
KC01011-(703510)	Advanced Fiber Optic Cable Development	$3,813
KC01012-(703511)	Massive Sensor Networks	$1,121
KC01015-(703514)	Enhanced Sensitivity Leak Detection and Location Technology	$2,543
KC01017-(703518)	Nano High-Voltage Components for Fireset Applications	$54,327
KC01020-(703519)	High-Performance Insulator Development	$16,154
KC01022-(703521)	Telemetry Mixed-Signal Integrated Circuit Development	$1,992
KC01023-(703526)	Feasibility of Mesomachining for Miniature Parts	$8,138
KC01025-(703533)	Enhanced Feature Recognition for Feature-Based Machining (FBMach)	$95,778
KC02001-(703522)	Condition-Monitoring of Machinery Using Artificial Intelligence	$42,105
KC02002-(703523)	Next Generation Processes for RF & Microwave Devices	$143,067
KC02003-(703524)	Advanced Concepts for Material Monitoring Systems	$11,354
KC02004-(703525)	Advanced Noncontact Inspection Techniques for Precision Dimensional Measurement	$213,010
KC02005-(703527)	High-Voltage Cable Insulation Defect Investigation, Detection, and Analysis	$29,334
KC02007-(703529)	Evaluate Feasibility of Using Superconducting Quantum Interferance Device (SQUID) Microscope for Weld Inspection	$95,680
KC02008-(703530)	Research and Evaluation of Controller Area Network (CAN)-based Telemetry	$85,616
KC02009-(703531)	Software-Defined Radio Systems	$35,347
KC02010-(703532)	Specialized Getters for Gases Other Than Hydrogen	$65,447
KC02011-(703534)	Telemetry Optical Data Bus Development	$76,977
KC02012-(703536)	Portable Image Recognition and Analysis	$307,534
KC02013-(703561)	Triple Point Field Attenuation for High-Power Ceramic-to-Metal Interfaces	$88,283
KC02024-(703535)	Evaluation of Continuous Tape Casting of Ceramic Materials for Multilayer Structures	$75,667
KC03001-(703537)	RFID Tagging of Classified/Ssensitive Material/Assets	$225
KC03002-(703538)	Evaluate the Feasibility of a Single-Containment Vessel	$77,246

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KCP - Kansas City Plant

Project ID	Project Name	Total
KC03003-(703539)	Suspension-Coated APO-BMI/Carbon Microsphere Molding Compound	$52,414
KC03004-(703540)	Enhanced Hydrogen Getter Development	$72,215
KC03005-(703541)	Integrated Miniaturized Solid-Phase Microextraction/Gas Chromatograph/Mass Spectrometer	$82,463
KC03006-(703542)	Preservation of Digital Data with Knowledge-Based Archives	$215,317
KC03007-(703543)	Nano-fireset Technology	$435,372
KC03008-(703544)	Distributed Initiation Control System	$245,577
KC03009-(703545)	High-Precision Laser Micromachining Development	$217,664
KC03010-(703546)	Packaging of Next-Generation Laser Optics	$77,788
KC03011-(703547)	High-g Penetrator Telemetry Electronics(703547)	$135,573
KC03012-(703548)	Microelectronic System in a Package with High-Density Interconnections	$151,167
KC03013-(703549)	Backend Processing of MEMS(Microelectromechanical Systems)	$275,971
KC03014-(703550)	Wireless Sensor Transmitter	$50,800
KC03015-(703551)	Small-Device Simulation and Modeling of High-Voltage Electromagnetic Field Enhancements, Characteristics, and Sensitivity	$64,757
KC03016-(703552)	Photonic Crystals as Dielectric Mirrors in a Laser Cavity	$36,181
KC03017-(703553)	Biometrics Using High-Resolution Optical Coherence Tomographic Imaging	$105,447
KC03018-(703554)	Knowledge-Aided Sensor Signal Processing & Expert Reasoning	$89,512
KC03019-(703555)	Investigation into Improved Techniques and Processes for Creating Small Holes (.005” Diameter) to Closer Location and Size Tolerances	$27,645
KC03020-(703556)	Integrated Data Collection and Replication (IDC&R)	$161,455
KC03021-(703559)	Finite Element Modeling of Fiber Reinforced Composite Structures	$46,538
KC03022-703558	Optimal Resource Allocation using Fuzzy Logic & Neural Nets for the Flexible Manufacturing System	$68,782
KC03024-(703560)	Digitization of Reservoir Process Design and Machine Program Generation	$179,171
KC03026-(703562)	Relaxor and Antiferroelectric Material Development For High Energy Capacitors	$142,993
KC03027-(703563)	High Power Ceramic Structure Machining and Characterization	$744,128
KC03028-(703564)	Military GPS Receiver Design	$18,473

Total # of Projects for KCP: 51 **Total Cost for KCP: $5,363,520**

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-2000510DR	A Scaleable Silicon-based Nuclear Spin Quantum Computer	$490,277
LANL-2001001ER	Coherent Femtosecond Pulse Progagation in Photonic Crystal Waveguides	$200,240
LANL-2001002ER	Principles of Optical Amplification and Lasing in Quantum-Dot Media	$210,065
LANL-2001003ER	Triplet Exitons in High Efficiency Organic Light-Emitting Diodes	$213,095
LANL-2001004ER	Understanding Low Pressure Electronegative Discharge Instabilities	$144,311
LANL-2001011ER	Optical Studies of Neural Function in Early Vision: Dynamic Imaging and Characterization of Intrinsic Responses	$170,103
LANL-2001012ER	Rapid, Ultrasensitive Haplotyping of Unamplified Genomic DNA	$198,626
LANL-2001013ER	Exploring How Hydrophobic Interactions Control the Energy Landscape of Proteins	$162,842
LANL-2001014ER	Following the Evolution of HIV	$168,704
LANL-2001015ER	Algorithms for Analysis of Protein-DNA Binding Interactions	$162,942
LANL-2001021ER	Improving Stereoselective Processes: Generation of Novel Catalytic Selenium-Containing Chiral Complexes	$225,272
LANL-2001022ER	New Entries to Fluorinated Ligands and Their Application Towards New Fluorinated Materials	$250,548
LANL-2001023ER	New Challenges in Multiple Bonding Between Lanthanides and Main Group Elements	$371,007
LANL-2001024ER	Controlled Synthesis of High Performance Nonlinear Optical Solids via Ionic Self-Assembly	$271,694
LANL-2001031ER	Smart Routers for Distributed Computational Grids	$169,918
LANL-2001033ER	Algorithms for Support Vector Machines	$147,899
LANL-2001034ER	Resource Utilization and Parallel Program Development with Buffered Coscheduling	$126,663
LANL-2001041ER	Integrated Micro-optical Devices for High-speed Data Storage, Communications, and Remote Sensor Applications	$215,989
LANL-2001051ER	Search for Tectonic Sources of the Lunar Atmosphere	$122,030
LANL-2001052ER	New Coupled Dynamical-Microphysical Model for Forecasting the Intensification of Hurricanes	$145,156
LANL-2001053ER	The Origin of Ultra High Energy Cosmic Rays	$150,900
LANL-2001054ER	Building a Foundation for Global Remote Sensing of Magnetospheric Plasmas	$185,823
LANL-2001061ER	Magnetization and Fluorescence Measurements of Particles in Flowing Streams	$219,267
LANL-2001062ER	Flow Sorting Microscope for Spatial Genomics	$252,458

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-2001063ER	Adaptive Picosecond Laser Ultrasonics	$28,956
LANL-2001064ER	Organic Thin Film Transistor Sensors	$235,221
LANL-2001071ER	Atomic Structure Studies of Materials Undergoing Phase Transitions Under Applied Pressure	$247,949
LANL-2001072ER	Smart Nano-Crystalline Polymers	$243,015
LANL-2001073ER	New Electronic States in Quasi-2D Intermetallics	$250,771
LANL-2001074ER	Carrier Dynamics Across the Metal Insulator Transition	$209,652
LANL-2001082ER	Synchronization of Spiking Neurons: A Functional Model for the Real-Time Segmentation of Natural Scenes	$158,472
LANL-2001083ER	Asymptotically Preserving Methods for Hyperbolic Systems with Stiff Relaxation	$93,202
LANL-2001084ER	Efficient Solution of Mixed Discretizations for Diffusion Problems	$174,419
LANL-2001085ER	Modeling the Dynamics of Quantum Computation for a Large Number of Qubits in Nano-Scale Solid State Quantum Computers	$173,581
LANL-2001091ER	Neutrino Production and Propogation in Astrophysical Environments	$147,115
LANL-2001092ER	Theory, Phenomenology and Cosmology of Models with Extra Dimensions	$138,999
LANL-2001093ER	Measurement of Neutron Cross Sections for Unstable Nuclei of Interest to S-Process Nucleosynthesis	$135,372
LANL-2001094ER	Studies of Neutrino Interactions and Oscillations at GeV Energies	$181,359
LANL-2001095ER	Innovative Detectors for the Search for the Z' Meson	$197,888
LANL-2001096ER	Implications of QCD on Signatures of the Quark-Gluon Plasma at RHIC	$193,631
LANL-2001101ER	Synthesis of new ternary phases in the superhard B-C-N System by laser-induced deposition	$98,624
LANL-2001104ER	Quantum Enabled Science and Technology	$506,450
LANL-2001105ER	Multiscale Material Interfaces	$302,663
LANL-2001106ER	Revolutionary Approaches to Knowledge Derivation from Large Data Sets	$350,188
LANL-2001109ER	Statistical Physics of Fiber Optics Communications	$298,641
LANL-2001210ER	The Contour Method for Residual Stress Mapping	$193,259
LANL-2001222ER	STM Electron Spin Precession Detection for Fundamental Physics and Nanotechnology	$501,344
LANL-2001511DR	Development of High Performance Cold Neutron Spectroscopy at LANSCE	$1,434,871
LANL-2001512DR	Advanced Experimental Characterization of Fluid Instability and Turbulence	$968,525
LANL-2001513DR	Superconductivity and Emergent Behavior in Correlated Electron Materials	$613,010

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-2001514DR	Thermodynamics of Plutonium	$1,190,154
LANL-2001515DR	Understanding and Controlling Charge Transfer Across Classes of Mixed-Valence Materials	$980,893
LANL-2001516DR	Toward a First-Principles Understanding of Plutonium	$1,003,770
LANL-2001517DR	Early Diagnosis of Infection	$1,220,241
LANL-2001518DR	Alpha Models: A Unique Opportunity in Fundamental Fluid Turbulence	$517,910
LANL-2001519DR	Modeling Complex Biological Systems: From Gene Dynamics to the Immune System	$1,378,815
LANL-2001520DR	Real-Time Transient Detection and its Application in Astrophysics	$854,472
LANL-2001521DR	Fundamental Electronic Interactions on Nanometer Lengthscales	$695,096
LANL-2001523DR	Microfluidic Devices for Protein Evolution and Expression	$805,992
LANL-2001526DR	Electric Dipole Moment of the Neutron	$1,730,538
LANL-2001531DR	Measurement and Analysis of Single Protein Molecule Folding Events	$1,048,106
LANL-2001532DR	Innovative Approaches for Nonlinearly Consistent, Multiple Time Scale, Computational Physics	$1,134,935
LANL-2001553DR	Physics Issues in Proton Radiography	$1,353,493
LANL-2001554DR	Development of an Integrated Influenza Early Warning System	$1,157,711
LANL-2001555DR	Sustainable Hydrology	$458,125
LANL-2001601DR	Dynamic Mix Studies with Proton Radiography (U)	$396,762
LANL-2001602DR	Optical Interferometry for Astronomy	$336,344
LANL-2001606DR	Scientific Opportunities With High Intensity Pulsed Cold and Ultra-Cold Neutron Sources	$897,396
LANL-2001607DR	Research to Support Simulation of Complex Biological Systems	$677,727
LANL-2001609DR	Performance Analysis and Modeling of Extreme-Scale Parallel Architectures	$465,202
LANL-2001926ER	Plasma Generation of Nanoparticles	$208,000
LANL-2001929ER	Study of Geometrically Frustrated Magnets and Underconstrained Lattices	$397,727
LANL-2001930ER	Development of a Strength Model for Silica-Filled Polydimethylsiloxane: a Combined Theory and Experimental Approach	$209,486
LANL-2001938DR	An Operating System for Scientific Computing	$244,989
LANL-20020003DR	Nuclear Isomer Physics	$1,290,615
LANL-20020006ER	Unstable Fluid-Fluid Interfaces	$204,617

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Project ID	Project Name	Total
LANL-20020007ER	Quantum Dynamics and the Quantum-Classical Transition with Entangled Spinor Wavepackets	$142,836
LANL-20020008ER	Mobility and Integrity of the Bacterial Chromosomal Gene Pool	$213,910
LANL-20020009ER	Cooling and Trapping Molecules with Laser Light	$385,496
LANL-20020010ER	Macroscopic Matter Wave Dynamics	$151,679
LANL-20020011ER	Unlocking the Mechanism of Protein Biosynthesis: Computational Investigation of the Ribosomal Functional Complex	$181,939
LANL-20020012ER	Protein Machines: Regulation of Enzyme Function Through Substrate and Protein Interactions	$147,758
LANL-20020014ER	Chemistry of the f-Block Elements in Room Temperature Ionic Liquids	$233,202
LANL-20020015ER	Quantum Wavepacket Dynamics with Trajectories	$198,939
LANL-20020016ER	New Catalysts Containing Phosphenium Groups for Chemical Conversions	$409,383
LANL-20020017ER	Excited States Dynamics and Photochemical Reactions in Large Molecular Systems	$220,018
LANL-20020018ER	Polymeric Chelators for Radioisotope Delivery Systems	$224,871
LANL-20020019ER	Advanced techniques in Discrete Simulation	$221,703
LANL-20020020ER	Estimating the Bayes Error from Empirical Data	$206,007
LANL-20020021ER	Identification of Interests, Trends and Dynamics in Document Networks	$105,444
LANL-20020022ER	Distributed Sensor Networks with Collective Computation for In-Situ Sensing	$201,991
LANL-20020023ER	Enabling Energy & Environmental Security: Chemical Extraction of Carbon dioxide from air	$252,902
LANL-20020024ER	Bone Morphogenesis and Regulation by External Fields	$157,285
LANL-20020025ER	Hydrogen Generation for Fuel Cells by Solid-Electrolyte Membrane Partial Oxidation Reactor	$217,852
LANL-20020026ER	Time Reversed Acoustics Applied to the Earth	$214,862
LANL-20020027ER	General Relativistic Astrophysics of Compact Sources: Core-Collapse Supernovae and Gamma-Ray Bursts	$249,020
LANL-20020028ER	Photon-Counting Optical Spectrophotometry: Opening a New Window for Discovery in Astrophysics	$307,548
LANL-20020029ER	Radio emissions from cosmic-ray/atmosphere interactions	$183,715
LANL-20020030ER	Ultrafast Broadband Optical Spectrometer for Dynamic Materials Characterization in a Magnetic Field	$200,791
LANL-20020031ER	Real-time Localization and Presentation of Neural Activity	$269,144
LANL-20020032ER	Vibration-free Cooling for Precision Cryogenic Measurements	$255,238

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-20020033ER	Single-Domain Nanomagnets: Fabrication and studies through the superparamagnetic transition	$244,898
LANL-20020034ER	Nanostructured Metals with Unusually High Fatigue Strengths	$221,136
LANL-20020035ER	New Vortex Phases in Layered Magnetic Superconductors	$178,414
LANL-20020036ER	Low Temperature Solid Solution Softening in Ordered Intermetallic Alloys - Towards Improvement of Ductility in High Temperature Materials	$205,198
LANL-20020037ER	Algebraic Approach to Interacting Quantum Systems	$180,457
LANL-20020038ER	Eliminating Short Time-Scales in Long-term, High-resolution Studies of Ocean Circulation: A First in Climate Modeling	$162,049
LANL-20020039ER	Statistical Properties of Granular Chains	$172,774
LANL-20020040ER	Implicit Subgrid Turbulence Modeling	$146,974
LANL-20020041ER	Development of an Experiment to Measure Neutron Beta Decay Parameters with a Polarized Cold Neutron Beam	$219,841
LANL-20020042ER	The Electric Dipole Moments and Time Reversal Violation in Low Energy Processes	$273,050
LANL-20020043ER	Study of Open-Charm Production at Rhic	$239,465
LANL-20020046DR	Understanding Protein Function: From Chemical Reaction to Molecular Recognition	$975,384
LANL-20020047DR	Electronic Devices Based on Nano-cell Organic Crystals	$969,084
LANL-20020048DR	Bringing Genomes to Life with Phage Antibodies and Mass Spectrometry	$1,001,877
LANL-20020050DR	Beryllium Chemistry: Toward an understanding of Chronic Beryllium Disease	$1,103,040
LANL-20020051DR	Life Cycles of Active Galaxies	$898,562
LANL-20020052DR	Applied Quantum Technologies	$1,507,831
LANL-20020053DR	Probing the Structural Dynamics of Condensed Matter with Ultrafast X-ray Diffraction	$1,088,924
LANL-20020054DR	Machine Learning for Real-World Data Analysis	$869,997
LANL-20020055DR	New Windows into Shocks at the Mesoscopic Scale	$1,068,433
LANL-20020058ER	Multi-scale Modeling and Simulation in Scientific Inference: Hierarchical Methods for Parameter Estimation in Porous Flow	$108,293
LANL-20020064DR	Interacting Complex Systems	$1,215,517
LANL-20020065DR	Developing a Scientific Basis for Detecting Life Across the Solar System	$832,621
LANL-20020068DR	Zero Emission Coal	$999,730
LANL-20020071DR	Damage Prognosis Solutions	$504,137

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Project ID	Project Name	Total
LANL-20020072DR	Experimental Investigation of Fundamental Processes Relevant to Fusion Burning, Strongly Coupled, Multi-Material Plasmas	$1,057,375
LANL-20020073DR	Advanced Arbitrary Lagrangian-Eulerian Methods for Complex Flows in Weapons	$487,832
LANL-20020076PRD	Theory of Quantum Information Processing	$80,168
LANL-20020077PRD	Consequences of Competing Interactions on Quantum Phase Transitions in Many-Particle Systems	$116,196
LANL-20020078PRD	Investigating the Kinetics of Free Radical Photo-Polymerizations for Nano-Scale Systems	$97,907
LANL-20020081PRD	Protein Dynamics/Multidimensional Spectroscopy	$101,898
LANL-20020084PRD	Elementary Particle Theory, General Relativity and String Theory	$35,470
LANL-20020088PRD	Electron Relaxation Dynamics of Strongly Correlated Systems via Femtosecond Spectroscopy	$25,919
LANL-20020090PRD	Investigation and Control of Ultrashort Pulse Dynamics in Photonic Crystal Structures	$56,397
LANL-20020091PRD	Modeling and Simulation of Cell Signaling Cascades Using Differential Equations and Monte Carlo Methods	$71,973
LANL-20020095PRD	Relaxation Phenomena in Non-Equilibrium, Disordered, Strongly Coupled Systems	$64,420
LANL-20020097PRD	Functionalized Water-Soluble Polymers for Technetium Complexation	$47,548
LANL-20020101PRD	Thermal Modeling of Cloud-Radiation-Surface Interactions in the Turbulent Boundary Layer	$98,500
LANL-20020103PRD	Ion-Cutting and Bonding of Silicon	$89,565
LANL-20020104PRD	Applications of OSL Dating to Fluvial Sediment Transport Research	$73,906
LANL-20020105PRD	Investigation of Nano-precipitates in Magmesium Diboride Superconductor Using Transmission Electron Microscopy (TEM)	$50,390
LANL-20020106PRD	Ultrafast Time-Resolved Terahertz Cyclotron Resonance/Hall Effect Spectroscopy	$110,845
LANL-20020108PRD	The Thermodynamics and Physics of f-Electron Bonded Metals and Alloys	$29,957
LANL-20020111PRD	Simulation of Self-Reproducing Molecular Systems	$1,856
LANL-20020112PRD	Plasma Instabilities in Astrophysical Accretion Disks	$35,973
LANL-20020113PRD	Computational and Theoretical Biophysics. Folding Simulation of Atomic Models of Proteins	$59,979
LANL-20020114PRD	Adaptive Ultrafast Optical Pulse Shaping	$20,761
LANL-20020116PRD	Chemistry of Quantum Dot Assemblies	$46,069

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-20020121PRD	Interaction and Scattering of Coherent Structures and Their Role in Fully Developed Turbulence	$20,571
LANL-20020123PRD	Atom-Trap Superfluidity	$80,353
LANL-20020128PRD	Condensed Matter Physics/Theory of Magnetic Resonance Force Microscopy/Theory of Impurities in Correlated Systems	$67,577
LANL-20020132PRD	Effects of atomic arrangements and defects on material properties	$51,957
LANL-20020133PRD	Biocatalysis using Ionic Liquids as Solvent	$26,036
LANL-20020134PRD	Spectroscopic Investigation of Molecular Interactions in Dye-Sensitized Solar Cells	$90,161
LANL-20020135PRD	Low Temperature Spectroscopic Studies of Individual Nanocrystals	$92,757
LANL-20020136PRD	Sensors for Siderophores Based on Pheromone Detection	$91,343
LANL-20020137PRD	Role of Water in Self-Assembled Structural Stability	$85,621
LANL-20020138PRD	Quantify the Relationship between the Nature of Structural Defects, the Defect Density, and the Hydration State of Clay Minerals and their Interaction with Fluids	$82,706
LANL-20020140ER	Theory of Isotope Effects in Recombination Reactions	$164,769
LANL-20020141PRD	Transition Metal Catalysts for Organic Compounds	$91,325
LANL-20020143PRD	Quantum Control in Atom Optics	$93,812
LANL-20020161PRD1	Tools for Realizable Quantum Information Processing	$105,030
LANL-20020167PRD1	Solid State Systems for Electric Dipole Moment Searches	$95,203
LANL-20020171PRD1	High Pressure Synthesis and Characterization of Clathrates	$131,707
LANL-20020183PRD1	Search for Quantum Critical Points using High Magnetic Fields	$99,841
LANL-20020194PRD1	Fracture and Crack Growth Behavior in Nanostructured Materials Under Cyclic Loading	$88,864
LANL-20020198PRD1	Arid Land Soil Microbial Processes and Communities	$91,080
LANL-20020202PRD1	The Origin of Elastic Nonlinear Response	$92,806
LANL-20020205DR	Advanced Linux for High Performance Computing	$451,503
LANL-20020206ER	Exploratory Synthesis of Correlated Electron Materials	$252,276
LANL-20020222ER	Energy Conversion and Photonics Based on Metal Complex Excited States	$367,082
LANL-20020225ER	Interfacial Solutions: Quasiliquids and Tropospheric Chemistry	$80,253
LANL-20020252PRD2	Interface-Controlled Deformation Physics of Nanolayered Metals	$92,833
LANL-20020263PRD2	Neutron Capture for Understanding Astrophysical Nucleosynthesis	$78,966

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-20020285ER	Carbon Management Through Iron Fertilization: Studies in Los Alamos Ocean Models	$49,995
LANL-20020288PRD2	Chemical Tuning and Disorder in Quantum-Critical Superconductors	$92,130
LANL-20020299PRD2	Neutron Scattering Study on Quantum Magnetism in Correlated Electron Materials	$101,212
LANL-20020304PRD2	Ultrafast Studies of Dynamics in Condensed Matter Systems	$93,749
LANL-20020320ER	Wave Reflections in the Cochlea	$256,145
LANL-20020360ER	New Modeling Techniques for Strongly-Coupled Atmospheric Processes that Occur in Wildland Fires	$150,850
LANL-20020364ER	Development of Flow Cytometry-Based Protease Model Systems	$49,987
LANL-20020387PRD3	Quantum State Engineering and Macroscopic Quantum Coherence in Superconducting Mesoscopic Systems	$4,511
LANL-20020393PRD3	Synthesis and Characterization of Nanomaterials	$73,534
LANL-20020396PRD3	Long-time dynamics of floppy systems	$93,090
LANL-20020399PRD3	Crystallization Mechanism in Metal-Oxide Thin Films	$95,564
LANL-20020407ER	Knowledge Systems for Decision Making	$74,787
LANL-20020417PRD3	Electron Microscopy Study of Defects at Interfaces in Nano-Scale Films	$99,772
LANL-20020420PRD3	Numerical determinations of viscoelastic effect on volcanic deformation: a tool for eruption prediction	$96,388
LANL-20020421PRD3	Dynamics of Granular Media	$92,658
LANL-20020458ER	Analysis of Bacillus anthracis Gene Expression	$172,999
LANL-20020459ER	Ultrahigh Weight Biomolecule Separation and Detection	$227,861
LANL-20020460ER	Stroboscopic studies of Polymer Dynamic Response to Stress	$136,399
LANL-20020461ER	Long Pulse Neutron Spallation Demonstration	$99,679
LANL-20020462ER	Synthesis, Characterization, and Modelling of Nanoporous Hybrid Materials	$173,006
LANL-20020463ER	Nanochemistry of Catalysts	$137,079
LANL-20020464ER	Towards a Fundamental Understanding of Lung Surfactant Properties	$141,989
LANL-20020468ER	Advanced Nuclear Fuel Cycle Studies	$240,198
LANL-20020476PRD4	SWNTs for Chemical/Biochemical Detection and Threat Reduction	$52,389
LANL-20020494PRD4	Preparation and Characterization of Monodisperse Semiconductor Quantum Dots: Towards True Artificial Atoms	$92,037
LANL-20020505PRD4	The Effect of Forest Disturbance and Climate Change on the Isotopic Composition of Tree Rings and Respired Carbon Dioxide	$61,094

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-20020517PRD4	The Synthesis of Metal Complexes containing Actinide-Transition Metal and Actinide-Actinide Metal Bonds	$74,337
LANL-20020521PRD4	Novel structures based on multicompartment self-assembly of fluoro/hydro-carbon surfactants	$93,667
LANL-20020525PRD4	Electronic Pumping of Nanocrstalline Quantum Dots	$84,891
LANL-20020529PRD4	Advanced Computational methods in Mobile Computing and Computational Biology	$84,009
LANL-20030022DR	Novel Physical Behavior of Nanostructured Materials Derived from Interface Atoms	$1,180,178
LANL-20030029DR	Structural Bioinformatics: Inferring protein function from sequence and structure on a genomic scale	$1,250,292
LANL-20030030DR	Neutrino Physics and Fundamental Symmetries	$1,364,975
LANL-20030036DR	New States of Matter near Zero-Temperature Phase Transitions	$1,620,587
LANL-20030037DR	Physics-Based Analysis of Dynamic Experimentation and Simulation	$1,182,780
LANL-20030038DR	Stochastic Closure for Multi-Scale Simulations	$255,820
LANL-20030050DR	Scaling Relationships in Biology: Developing and Applying a Unifying Theory from Molecular through Biosphere Scales	$1,479,768
LANL-20030059DR	Clathrate Hydrate Science and Technology	$1,326,775
LANL-20030067DR	Water on Mars	$987,834
LANL-20030068DR	Non-equilibrium Electron Spin Transport and Dynamics in Solids	$1,436,686
LANL-20030069DR	Interfacial Energy and Charge Transfer in Multifunctional Bio-Inspired Nano-Assemblies	$1,152,415
LANL-20030084DR	Quasiparticles and phase transitions in high magnetic fields: critical tests of our understanding of Plutonium	$1,523,350
LANL-20030091DR	Actinide Partitioning at Solid-Solution Interfaces	$1,192,403
LANL-20030119ER	Synthesis of Labeled Glycosaminoglycans for Structural and Dynamical Studies of Macromolecular Complexes	$231,160
LANL-20030129ER	Collisionless Magnetic Reconnection in 3D Geometries	$211,920
LANL-20030137ER	Improving Local Search	$236,875
LANL-20030138ER	Computational Study of Intense Short-Pulse Laser-Matter Interactions	$248,149
LANL-20030151ER	Calculating the kaon bag parameter B_K on unquenched lattices	$263,405
LANL-20030162ER	Automatic Detection of Salient Objects in Real-world Imagery	$78,620

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-20030169ER	Determining Fundamental Roles of Magnetic Field in the Universe: Laboratory plasma flow experiments on Magneto-rotational Instability (MRI) and laminar plasma dynamo	$297,242
LANL-20030179ER	Bacillus Anthracis Iron Acquisition	$290,286
LANL-20030181ER	Efficient Computation of Free Energy Differences Relevant to Rational Drug Design	$215,651
LANL-20030210ER	Regularized Line Vortices of the Lagrangian-Averaged Euler Equations	$242,102
LANL-20030216ER	Strong Ultrafine Grain Metals by Severe Plastic Deformation and Strain Path Changes: Application to Beryllium (Be)	$252,129
LANL-20030225ER	Processor-Coupled Computing Fabric	$257,867
LANL-20030227ER	Estimation of Aquifer Recharge Using Time-Lapse Gravity Surveys	$228,964
LANL-20030232ER	Catalysis by Artificial Inorganic Enzymes	$266,661
LANL-20030248ER	Distributed Multi-scale Markov Chain Monte Carlo for uncertainty quantification in inverse problems	$184,639
LANL-20030251ER	Using Neutrons to Explore Peculiar elastic Behavior of Rocks	$178,303
LANL-20030258ER	Immune Cell-Based Biosensor for Rapid Pathogen Detection and Identification	$272,744
LANL-20030261ER	Transport studies of inhomogeneous superconducting vortex motion in confined geometries	$183,875
LANL-20030292ER	Synthesis and Characterization of Selective Ligands	$342,574
LANL-20030301ER	Magnetocarcinotherapy: A Novel Molecular Imaging Diagnostic and Treatment Method for Cancers	$274,634
LANL-20030310ER	Polymer-Assisted Aqueous Deposition (PAAD) of Metal-Oxide Films	$286,074
LANL-20030317ER	Three Dimensional Effects in Core-Collapse Supernovae: Rotation, Convection and Neutron Star Kicks	$336,283
LANL-20030342ER	Waveguide interferometry with Bose-Einstein condensates	$380,243
LANL-20030351ER	Computational Schemes for Multiscale Modeling of Polymers	$223,107
LANL-20030352ER	Double Beta Decay	$390,043
LANL-20030355ER	Thin-film Semiconductor Sensors on Polycrystalline Substrates	$255,569
LANL-20030356ER	An Integrated Microarray-based Platform for Sensitive High-throughput Pathogen Detection and Identification	$329,315
LANL-20030359ER	Electrically Pumped Colloidal Nanoemitters: Combining Top-Down and Bottom-Up Approaches in Nanoscale Engineering	$160,161
LANL-20030360ER	Viral Invasion: Breaching the Cells Outer Defenses	$289,862
LANL-20030363ER	Testing for a Relativistic Symmetry in the Nucleon-nucleon Interaction	$138,196

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-20030365ER	Cosmological Vacuum Energy	$147,690
LANL-20030398ER	Desalination by Molecular Design	$228,602
LANL-20030400ER	Atomic Level Engineering of Nanostructures and Devices	$246,934
LANL-20030419DR	Assembly and Actuation of Nanomaterials Using Active Biomolecules	$361,779
LANL-20030420DR	Active Photonic Nanostructures	$870,663
LANL-20030486DR	Astrophysical Survey Science and Technology	$439,719
LANL-20030487DR	Physics of Information	$1,004,273
LANL-20030488ER	Formation and Distribution of Galaxies: An Advanced Computational Approach	$325,041
LANL-20030489DR	Advanced Diagnostics for Characterizing Nanoscale Materials	$1,002,550
LANL-20030494ER	Design of the Next Generation Ground-Based Gamma-Ray Burst Detector	$97,537
LANL-20030497PRD1	Analysis and Generation of Magnetic Flux Pinning Sites in YBa2Cu3O7-d Films	$71,093
LANL-20030508ER	Mass Spectrometry and Systems Biology Based Approach for Identifying Biomarkers in Cancers	$249,878
LANL-20030517ER	Development of Microfluidics Analytical Platform for On-chip Genetic Assays	$184,901
LANL-20030519PRD1	Solid-State Actinide Chemistry	$70,786
LANL-20030522PRD1	Searching for Superhard Materials from Nanometric Scale and at Extreme Conditions	$80,607
LANL-20030526PRD1	Identification of the Energy Gap in the 2D Metallic State of Strongly Interacting Fermions	$7,842
LANL-20030534PRD1	Genomic Instability and Mammalian Aging	$3,116
LANL-20030544PRD1	Ultracold Collisions of Charged Particles	$33,458
LANL-20030549PRD1	Physics of Metallo-Organic / Organic Materials and Devices	$36,913
LANL-20030558ER	New Strategies for Enhancing the Reactivity of Organo-f-Element Complexes	$190,370
LANL-20030562PRD1	Synthesis of Continuous Carbon Nanotubes	$43,695
LANL-20030568PRD1	Interaction of magnetism and superconductivity in novel superconductors	$94,250
LANL-20030579PRD1	Cosmic Cinematography: Opening a New Window for Discovery in Astrophysics	$91,184
LANL-20030596ER	Rare event statistics and scaling in systems far from equilibrium	$102,497
LANL-20030597ER	LOFAR - A Low Frequency Radio Interferometer for Astronomy and Space Sciences	$51,914
LANL-20030603ER	Experimental Efforts Towards a Test of Fine Structure Constant Variation	$521,234

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LANL - Los Alamos National Lab

Project ID	Project Name	Total
LANL-20030604ER	Preparation & Characterization of Inorganic & Organic High-Nitrogen Energetic Materials	$43,505
LANL-20030611PRD2	Active Photonic Structures Based on Semiconductor Nanocrystals	$59,035
LANL-20030619ER	Study of Dielectric Properties of Liquid Helium	$72,044
LANL-20030620ER	Acoustic Streaming in Thermoacoustic Devices	$170,048
LANL-20030622ER	Complex Dynamical Earth Systems	$188,492
LANL-20030623ER	Space Weather Foundations	$57,269
LANL-20030624ER	Dynamical Astrophysics	$266,433
LANL-20030625ER	Planetary Geophysics-Core to Crust	$398,767
LANL-20030635PRD2	Theoretical and computational studies of the stability of closed magnetic fieldline systems	$23,745
LANL-20030637PRD2	Global 3-D magnetospheric structure	$22,139
LANL-20030642PRD2	Superheating upon superfast dynamic loading	$27,484
LANL-20030643PRD2	Theoretical studies of excited states in transition metal derivatized polymers	$24,640
LANL-20030663PRD2	Electric Field Control of Optical and Electronic Properties of Semiconductor Quantum Dots	$34,597
LANL-20030664ER	Compton Enhanced Gamma Reconstruction	$51,966
LANL-20030671ER	New Directions in Catalysis	$47,417
LANL-20030672ER	Novel Optical Processing Methods	$49,125
LANL-20030680PRD2	Pattern formation and dynamics in systems with competing forces	$10,529
LANL-20030699PRD3	Trace-Level Analysis of Actinides Using Membrane-Based Ion-Selective Chemical Sensors	$28,968
LANL-20030718PRD3	Neutrino Physics, Astrophysics and Cosmology	$1,655
LANL-20030744PRD3	Investigation of electrical properties of BST multilayers for applications in tunable microwave devices	$5,919
LANL-20030760ER	Selection of binding agents against SARS proteins for diagnosis and therapy	$63,891
LANL-20030766PRD3	Development of Self-Monitoring and Self-Repairing Structural Systems using Smart Materials	$41,964
LANL-20030782ER	Feasibility Study: Using Background Radiation for Radiography	$65,492
LANL-20030839ER	Proteins in Protein Networks	$143,470
LANL-20040261ER	Nonequilibrium Mechanics of Geomaterials	$55,365

Total # of Projects for LANL: 299 **Total Cost for LANL: $96,089,684**

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LBNL - L. Berkeley National Lab

Project ID	Project Name	Total
LB01002	Advanced Simulation of Complex Beam Systems	$74,950
LB01003	An Ultra-Fast X-Ray Source for fsec Dynamics	$499,921
LB01010	Development of a Neutral Molecule Synchrotron Storage Ring	$149,759
LB01011	Photoionization Experiments on Atoms and Molecules Adsorbed onto Helium Droplets	$109,801
LB01012	Nonlinear Mathematical Models of Phenomena Related to Petroleum Mining and Geological Engineering	$79,217
LB01016	Second-Order Methods for Solid-Fluid Shock Coupling with Application to Martian Meteorites	$49,707
LB01024	Dynamic Reorganization of Chromosome Architecture During Meiosis	$199,975
LB01032	Design of Digital Signal Processing Electronics for High Resolution Solid State Detectors	$150,142
LB01034	Molecular Recognition and Protein/Protein Interactions in Signal Transduction	$100,041
LB01037	Modeling of High Energy Physics Detectors	$99,799
LB01038	POLARBEAR: An Experiment to Measure Polarization Anisotropy in the Cosmic Microwave Background	$100,108
LB02001	Novel Coherent Terahertz and Infrared Source using a Laser Wakefield Accelerator and Applications	$239,295
LB02002	Solid-State Quantum Computer Development with Single Ion Implantation	$248,088
LB02003	Synchrotron and Wiggler Radiation Measurement of the Longitudinal Bunch Distribution in Hadron Colliders	$174,697
LB02004	Development of a Coherent Far-Infrared Synchrotron Radiation Source at the Advanced Light Source	$279,678
LB02006	Simulations of Femtosecond X-Ray Spectra of Photoexcited Molecules	$74,944
LB02007	Picosecond Time-Resolved Photo-Electron Emission Microscopy (PEEM) on Magnetic Nano-Structures	$75,157
LB02008	Bonding in Low-Dimensional Structures: Theory and Computation	$75,120
LB02009	Disorder and Multiple Length Scales in Non-Fermi Liquid f-electron Intermetallics	$80,419
LB02010	Investigation of Charge Transfer in Organic Electronics using Ultrafast Spectroscopy and Targeted Synthesis	$174,650
LB02012	Experimental Mathematician's Toolkit	$74,532
LB02013	Infrastructure for Improving Protein Structure Predication in Computational Biology	$119,530

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LBNL - L. Berkeley National Lab

Project ID	Project Name	Total
LB02014	New Machine Learning and Data Mining Methods for Genomics and Information Retrieval	$99,576
LB02015	Numerical Simulation of Fuel Cells	$124,578
LB02017	Segmentation of Mammary Gland Ductal Structure Using Geometric Methods	$89,465
LB02018	Combinatorial Algorithms in Scientific Computing	$99,113
LB02019	Scalable Methods for Studying Collisional Breakup and Rearrangement Processes	$226,583
LB02020	Microbial Controls on Metals in the Environment	$149,999
LB02023	Coupling of Seismologic and Hydrologic Processes	$45,273
LB02024	Development of Monitoring Strategies for Carbon Sequestration Verification Using Coupled Subsurface and Subaerial Simulation	$99,947
LB02025	Applying a Coupled Climate-Land Surface Regional Model to Deduce Trends in Soil Moisture from Air Temperature Data	$149,710
LB02026	Reactivity of Nanoparticles in Natural Environments	$150,000
LB02028	Miniaturized Systems for Particle Exposure Assessment	$99,712
LB02029	Health Effects of Indoor and Outdoor Particle Concentrations, Assessed with Epidemiology and Molecular Biology	$99,688
LB02030	Structural Studies of Presenilin-1, a Membrane Protein Critical to the Onset of Alzheimer's Disease	$44,997
LB02031	Systems Biology: Biological Input-Output Devices	$199,957
LB02033	Nanoscale Electronic Phase Separation: A New Paradigm for Complex Electronic Materials	$100,381
LB02034	Self-Assembling Arrays of Nanocrystals Templated by Cytoskeletal Proteins	$94,005
LB02036	Photoemission Study of Magnetic Quantum Well Interaction	$89,290
LB02039	Effective Field Theory and Few-Nucleon Systems	$99,965
LB02040	Allosteric Mechanisms in Protein Kinases	$125,621
LB02041	Structure and Functional Characterization of Heme Protein Sensors	$100,082
LB02042	Development of Techniques for Structural Analysis of Large, Multi-Subunit Eukaryotic Transcription Complexes	$100,085
LB02043	Coherent Control and Quantum Information in Polyatomic Molecules	$201,378
LB02044	Scientific Investigations and Technique Development of Wet Spectroscopy, High-Pressure Photoelectron Spectroscopy, and Scanning Transmission X-ray Microscopy for Molecular Environmental Science	$134,794
LB02045	Parallel Methods for Robust Optimization and Uncertainty Quantification	$129,729

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LBNL - L. Berkeley National Lab

Project ID	Project Name	Total
LB02047	Detector Research and Development for Low Energy Solar Neutrino Detectors	$100,015
LB02048	Research on a Next Generation Vertex Detector	$150,043
LB02049	Conformation and Reaction Dynamics at the Single Molecule Level	$99,850
LB03001	Understanding the Agrobacterium Tumefaciens T-DNA Transporter: a Type IV Secretion System	$68,709
LB03002	Molecular Control of Interfaces between Biological and Synthetic Materials	$298,444
LB03003	Biomechanics of Cell-Matrix Adhesion in Normal and Malignant Mammary Epithelial Cells	$58,809
LB03004	Comparative Studies Between Earth and Planetary Sciences	$49,952
LB03005	High Spatial and Energy Resolution Electron Energy Loss: Spectroscopy for Nanoscale Materials Applications	$74,564
LB03006	Microscopic Imaging in High-Throughput Screening for Crystals of the Bacterial Ribosome	$150,257
LB03007	New Femtosecond Spectroscopies of Structural Dynamics: IR Pump-X-Ray Probe Experiments	$70,626
LB03008	Application of Real-Time PCR with Reverse Transcription for Quantification of Specific Microbial Activity in Complex Communities	$80,000
LB03009	Short Period Superconducting Undulator Development	$149,723
LB03010	Analysis of Gene Regulation Through Systematic Determination of Regulatory Protein Binding Specificities	$124,857
LB03012	Interactive Visualization Methods for Exploration and Comparison of Multi-Billion Base Pair Sequence Data	$149,439
LB03013	Novel Ultra-high Resolution (to 10 meV) Inelastic Scattering Spectrograph to Study Coupled Electron-Orbiton-Phonon Interactions	$261,320
LB03015	Determining the Light-Absorbing Properties of Aerosol Particles	$100,561
LB03016	Concepts for a Premier Stable Beam Capability for Low Energy Nuclear Physics	$150,001
LB03017	Modeling Quantum Coherence and Transport in Nanoscale Spin, Charge, and Flux Devices	$58,226
LB03018	Chemical Dynamics Under Reaction Conditions	$89,479
LB03019	Aberration Correction of Electron Microscopes	$129,974
LB03020	"Ex-Situ" and "Remote" Molecular Imaging and Spectroscopy	$338,023
LB03021	Optimal Solvers for Infinite-Dimensional Hamiltonian Systems	$149,515
LB03022	Superconducting Magnet Systems for ex Situ NMR Spectroscopy	$140,011
LB03023	Soft X-Ray Spectroscopy of Liquid Surfaces	$80,819

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LBNL - L. Berkeley National Lab

Project ID	Project Name	Total
LB03024	Characterization of Adult Stem Cell Involvement in Mammary Gland Development	$99,940
LB03025	X-Ray Diffraction for the Study of Strongly Correlated Materials	$77,837
LB03026	A "MEMS Test Kit" for Structure-Mechanical Property Relationships at the Nanoscale	$80,087
LB03027	Evaluation of Dynamic Air Quality Impacts of Distributed Generation	$79,999
LB03028	Electron Production and Collective Field Generation in Intense Particle Beams	$125,043
LB03029	All Nitride, Full Solar Spectrum Photovoltaics	$124,652
LB03030	Evolution of Computer Architecture Alternatives	$298,471
LB03031	Fabrication and In-Situ TEM Study of Nanocontacts in Embedded Nanophase Systems	$100,022
LB03032	Identification and Analysis of Determinants of Centromere Identify in Drospophila	$249,973
LB03033	Future Experiments in Neutrino Physics	$47,041
LB03034	Identification and Characterization of Conserved Noncoding Sequences Using Comparative Genomics and Transgenic Technology	$65,077
LB03035	Microscopic Theory of Protein Surface: Structure, Response, and Design	$133,176

Total # of Projects for LBNL: 82 **Total Cost for LBNL: $10,687,993**

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LLNL - L. Livermore National Lab

Project ID	Project Name	Total
01-ERD-002	Reconfigurable, Optical Code-Division Multiple Access for Fiber-Optic Networks	$231,334
01-ERD-004	Generalized Methods for Finite-Element Interfaces	$225,014
01-ERD-005	Higher-Order, Mixed Finite-Element Methods for Time-Domain Electromagnetics	$262,346
01-ERD-009	Disposable Polymerase Chain Reaction Device	$301,486
01-ERD-010	Modeling Tools Development for the Analysis and Design of Photonic Integrated Circuits	$77,498
01-ERD-013	Adaptive Optics Imaging and Spectroscopy of the Solar System	$232,287
01-ERD-014	First Physics from BaBar	$424,936
01-ERD-015	Positrons and Positronium in Insulators	$293,992
01-ERD-017	Smart Nanostructures from Computer Simulation	$294,167
01-ERD-018	Shock Recovery of Organic Liquids: From the Origin of Life to the Defense of the Nation	$404,245
01-ERD-019	Direct Characterization of the Electronic Structure of Shocked and Heated Materials	$215,015
01-ERD-020	Constraining Nucleosynthesis Models: Mapping Titanium-44 in Cassiopeia A	$582,877
01-ERD-022	Microstructural Origins of Dynamic Fracture in Ductile Metals	$180,129
01-ERD-026	Shear Localization and Fracture in Shocked Metals	$237,579
01-ERD-029	Metastability and Delta-Phase Retention in Plutonium Alloys	$451,839
01-ERD-030	Thermodynamics and Structure of Plutonium Alloys	$465,738
01-ERD-031	High-Pressure, High-Strain-Rate Materials Effects	$478,674
01-ERD-032	Modeling and Characterization of Recompressed Damaged Materials	$154,025
01-ERD-033	Double-Shell Target Design and Experiments at Omega: Nonlinear Mix Studies for Stockpile Stewardship	$343,966
01-ERD-035	The Deformation-DIA: A Novel Apparatus for Measuring the Strength of Materials at High Strain to Pressures at Elevated Temperature	$376,671
01-ERD-036	Designer Diamond Anvils for Novel High-Pressure Experiments: Magnetic Susceptibility Experiments on Actinides to Multimegabar Pressures	$394,510
01-ERD-042	Resolving Nuclear Reactor Lifetime Extension Questions: A Combined Multiscale-Modeling and Positron-Characterization Approach	$262,390
01-ERD-044	First-Principles Molecular Dynamics for Terascale Computers	$276,274
01-ERD-047	Ultrawideband Communications	$671,684

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LLNL - L. Livermore National Lab

Project ID	Project Name	Total
01-ERD-054	Nanoscience and Nanotechnology in Nonproliferation Applications	$304,497
01-ERD-063	Novel Approaches for Monitoring Intrinsic Bioremediation	$174,313
01-ERD-064	Chemical Deactivation of Reactive Uranium	$149,923
01-ERD-065	Evaluation and Optimization of Methyl-Tert Butyl Ether Biodegradation in Aquifers	$208,002
01-ERD-072	Further Development of Wet-Etching Tools for Precision Optical Figuring	$149,927
01-ERD-073	Computational Methods for Collisional Plasma Physics	$310,280
01-ERD-075	Developing a Radiative-Shock Test Bed	$232,013
01-ERD-080	Integrated Microfluidic Fuel Processor for Miniature Power Sources	$319,451
01-ERD-083	High-Average-Power, Frequency-Agile Fiber Lasers	$168,557
01-ERD-085	Enhancement of Strength and Ductility in Bulk Nanocrystalline Metals	$211,196
01-ERD-086	Dip-Pen Nanolithography for Controlled Protein Deposition	$410,584
01-ERD-089	Electromagnetic Imaging of Carbon Dioxide Sequestration at an Enhanced Oil Recovery Site	$146,056
01-ERD-091	Accelerated Carbonate Dissolution as a Carbon Dioxide Separation and Sequestration Strategy: Continued Experimentation and Simulation	$142,245
01-ERD-093	High-Accuracy X-ray Imaging of High-Energy-Density Physics Targets	$448,528
01-ERD-095	Ultrahigh-Power Inorganic Liquid Laser	$245,537
01-ERD-096	Developing Smart Seismic Arrays: A Simulation Environment, Observational Database, and Advanced Signal Processing	$355,443
01-ERD-097	Focusing Hard X-Rays at Current and Future Light Sources for Microscopy and High-Power Applications	$321,067
01-ERD-098	Spectroscopy of Shock-Compressed Deuterium	$274,876
01-ERD-101	Stroke Sensor Development using Microdot Array Sensors	$398,399
01-ERD-103	Mesochem: Chemical Dynamics on a Mesoscopic Scale	$233,376
01-ERD-105	Study of Chemical Reactions Controlling the Mobility of Uranium and Related Contaminants in Ground and Surface Water Systems with Emphasis on Apatite	$172,482
01-ERD-106	Use of Hydrophobic Silica Aerogel/Granular-Activated Carbon Composite to Remove Arsenic and Hexavalent Chromium from Groundwater	$152,996
01-ERD-107	Nonlinear Saturation of Parametric Laser-Plasma Instabilities	$180,536
01-ERD-108	Retrospective Plutonium Biodosimetry by Modeling Urinary Plutonium-239 from Archived Occupational Samples	$203,479
01-ERD-111	Development of Synthetic Antibodies	$452,892

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LLNL - L. Livermore National Lab

Project ID	Project Name	Total
01-ERD-112	Imaging of Isotopically Enhanced Molecular Targeting Agents	$364,868
01-ERI-001	Probing the Properties of Cells and Cell Surfaces with the Atomic Force Microscope	$198,070
01-ERI-003	Starburst Galaxies	$200,448
01-ERI-004	Lithic Astronomy: Absolute Chronometers and Correlated Isotopic Anomalies in Meteorites	$200,859
01-ERI-006	Accelerator Analyses for Protein Research	$205,490
01-ERI-007	Isotopic Tracing of Fuel Components in Particulate and Gaseous Emissions from Diesel Engines using Accelerator Mass Spectrometry	$145,080
01-ERI-009	Natural Variability and Anthropogenic Influence on Climate: Surface Water Processes in the Indonesian Seas over the Last 120 Years	$198,026
01-LW-040	Fermion Monte Carlo	$13,989
01-SI-002	Pathogen Pathway Project	$1,148,401
01-SI-003	The Stochastic Engine: Improving Prediction of Behavior in Geologic Environments We Cannot Directly Observe	$1,262,894
01-SI-004	Material Strength at High Pressure	$1,536,151
01-SI-007	Ultrafast Materials Probing with the Falcon/Linac Thomson X-Ray Source	$1,929,213
01-SI-008	INCCA: Integrated Climate and Carbon	$703,078
01-SI-010	SATRN: Secure Air-Optic Transport and Routing Network	$1,888,990
01-SI-012	Strategic Initiative in Applied Biological Simulations	$282,455
02-ERD-002	Single-Cell Proteomics with Ultrahigh-Sensitivity Mass Spectrometry	$679,020
02-ERD-004	Structure and Spectroscopy of Black Hole Accretion Disks	$197,587
02-ERD-006	Reaching Isochoric States of Matter by Ultrashort-Pulse Proton Heating	$446,845
02-ERD-008	Extremely-High-Bandwidth Diamond Tool Axis for Weapons Physics Target Fabrication	$239,109
02-ERD-010	Ultrasonic Nondestructive Evaluation of Multilayered Structures	$335,973
02-ERD-011	Radial Reflection Diffraction Tomography	$123,402
02-ERD-012	Proton Radiography of Laser-Plasma Interactions with Picosecond Time Resolution	$74,835
02-ERD-013	Dense Plasma Characterization by X-Ray Thomson Scattering	$78,415
02-ERD-014	Nanoscale Fabrication of Mesoscale Objects	$450,566
02-ERD-016	A Three-Dimensional Model of Signaling and Transport Pathways in Epithelial Cells	$217,729

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LLNL - L. Livermore National Lab

Project ID	Project Name	Total
02-ERD-018	Development of Ultrasensitive High-Speed Biological Assays Based on Two-Dimensional Flow Cell Detection of Single Molecules	$657,470
02-ERD-021	Modern Chemistry Techniques Applied to Metal Chelation with Medical and Environmental Applications	$150,302
02-ERD-023	Gaseous Laser Targets and Optical Diagnostics for Studying Compressible Turbulent Hydrodynamics	$159,623
02-ERD-025	The Properties of Actinide Nanostructures	$404,643
02-ERD-027	Local-Scale Atmospheric Reactive-Flow Simulations	$266,155
02-ERD-032	Nanofilters for Metal Extraction	$170,788
02-ERD-033	Rapid Resolidification in Metals using Dynamic Compression	$282,440
02-ERD-034	Automated Imagery Data Exploitation (AIDE)	$85,598
02-ERD-035	Remote-Sensing Signatures for Ballistic Target Interceptions	$387,004
02-ERD-036	Near-Real-Time Assessment of Health Risks from Simulated Contaminant Wet Deposition using Real-Time Rainfall and Geographic Information System Databases	$168,775
02-ERD-038	Investigation of the Shores of the Island of Stability	$240,699
02-ERD-040	Development of a Fast Microfluidic Mixer for Studies of Protein-Folding Kinetics	$75,522
02-ERD-041	Development of a Predictive Computational Tool for Short-Pulse, High-Intensity Laser-Target Interactions	$88,725
02-ERD-043	Atomically Controlled Artificial and Biological Nanostructures	$331,817
02-ERD-044	Infrastructure Response to Natural and Man-Made Ground Motions: High Performance Computing and Distributed Sensing for Regional Scale Prediction and Response	$64,742
02-ERD-045	Rapid Assay Development for BW Agent Detection and Surveillance	$795,428
02-ERD-046	Magnetic Transition Metals and Oxides at High Pressures	$373,653
02-ERD-047	A Revolution in Biological Imaging	$377,537
02-ERD-048	Advanced Filtration and Regeneration Techniques Based on Nanoporous and Aerogel Technologies	$151,452
02-ERD-052	Three-Dimensional Astronomy: Scientific Observations with the Livermore Imaging Fourier Transform Spectrograph	$99,663
02-ERD-054	Single-Particle Nanotracking for Genomes-to-Life Applications	$98,245
02-ERD-058	Transport and Biogeochemical Cycling of Iodine-129 from Nuclear Fuel Reprocessing Facilities	$162,025
02-ERD-061	Concealed Threat Detection at Multiple Frames-per-Second	$406,040

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Project ID	Project Name	Total
02-ERD-064	Program of Simulations and Experiments for Assessment of Rapid Multipurpose Cargo-Scanning Technologies	$1,099,752
02-ERD-066	Dynamic Simulation Tools for the Analysis and Optimization of Novel Filtration, Sample Collection and Preparation Systems	$195,924
02-ERD-070	Exploring the Linkage between Impurities and Optical Properties in Rapid Growth of Crystals	$1,132,743
02-ERD-071	Development of a Quantum-Limited Microwave Amplifier using a dc Superconducting Quantum Interference Device	$100,243
02-ERI-003	ViSUS: Visualization Streams for Ultimate Scalability	$465,258
02-ERI-004	A Tunable, Monochromatic, 1-Angstrom, Compton-Scattering X-Ray Microfocus for Multiwavelength Anomalous Diffraction Experiments	$261,980
02-ERI-005	Direct Imaging of Warm Extrasolar Planets	$201,142
02-ERI-006	Exchange-Coupling in Magnetic Nanoparticles Composites to Enhance Magnetostrictive Properties	$200,875
02-ERI-007	Enabling Large-Scale Data Access	$203,906
02-LW-001	Generation of Single-Cycle Light Pulses	$191,100
02-LW-003	Automated 3-D Protein Structure Predictions Based on Sensitive Identification of Sequence Homology	$189,955
02-LW-022	Quantum Vibrations in Molecules: A New Frontier in Computational Chemistry	$147,867
02-LW-026	Beta-Decay Experiments and the Unitarity of the Cabibbo-Kobayashi-Maskawa Matrix	$170,009
02-LW-038	Photoluminescent Silica Sol-Gel Nanostructured Materials Designed for Molecular Recognition	$185,084
02-LW-043	The Kinetic Stabilizer: A Route to a Simpler Magnetic Fusion System	$165,526
02-SI-004	Short Pulse: An Initiative to Enable Relativistic Applications for Advanced ICF and Stockpile Stewardship	$2,242,867
03-ERD-001	Chemical Dynamics at Interfaces	$100,135
03-ERD-002	Adaptive Optics Views of the Hubble Deep Fields	$335,230
03-ERD-003	Photon Collider Physics	$314,744
03-ERD-004	QED and Electron Collisions in the Super Strong Fields of K-Shell Actinide Ions	$403,780
03-ERD-005	Exploring Properties of Quantum Chromodynamics with Proton-Nucleus and Deuteron-Nucleus Collisions	$341,856
03-ERD-006	Correction of Distributed Optical Aberrations	$292,137

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Project ID	Project Name	Total
03-ERD-007	Investigation of an Ultrafast Direct Radiation-Driven High-Speed Interferometric Detector	$140,700
03-ERD-008	Electron Production and Collective Field Generation in Intense Particle Beams	$203,237
03-ERD-009	Coupled Turbulence-Transport Model for Edge Plasmas	$499,294
03-ERD-012	Techniques for Judging Intent Behind Cyber Attacks	$113,641
03-ERD-013	DNA Detection through Designed Apertures	$279,915
03-ERD-015	Strain Rate Scaling of Deformation Mechanisms	$195,233
03-ERD-017	Phonon Dispersion Curves Determination in delta-Phase Plutonium-Gallium Alloys	$502,102
03-ERD-018	Determination of the Microstructural Morphology of Shock-Induced Melt and Resolidification	$198,093
03-ERD-019	Mononitride Fuel Development for STAR and Space Applications	$119,501
03-ERD-020	A Comprehensive Study of Surface Chemistry for Application to Engine NOx Aftertreatment	$144,253
03-ERD-021	Analyzing the Long-Range Transport of Asian Aerosols using an LLNL Atmospheric Model and CAMS/NOAA Measurements from Northern California	$176,326
03-ERD-022	Environmental Fate of Organo-Phosphorus Compounds Related to Chemical Weapons	$186,220
03-ERD-023	Propagation Models for Predicting Communication System Performance in Tunnels, Caves, and Urban Canyons	$233,267
03-ERD-024	Microfluidic System for Solution Array-Based Bioassays	$352,096
03-ERD-025	Cargo Container Security Sensor System	$371,135
03-ERD-026	Computation of Hypersonic Flow around Maneuvering Vehicles with Changing Shapes	$56,353
03-ERD-027	Adaptive-Mesh-Refinement Algorithms for Nonlinear Structural Deformations using Parallel, Unstructured Finite-Element Codes	$208,602
03-ERD-030	Entity-Based Simulation of Biological Systems	$374,867
03-ERD-031	Detection and Tracking in Video	$171,912
03-ERD-032	Scalable Multiple-Sequence Alignment for Pathogen Signatures	$269,982
03-ERD-033	Scalable Discretization-Enhanced Solvers	$233,983
03-ERD-038	An Agent that Prohibits Microbial Development and Infection	$251,534
03-ERD-039	Thermally Driven Processes and Atmospheric Transport and Dispersion of Stable Macroparticles	$231,575

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Project ID	Project Name	Total
03-ERD-040	Photochromic Radiation Dosimetry	$355,306
03-ERD-042	Predicting Effects of Climate Change/Variability on Water Availability	$662,404
03-ERD-044	Colliding Nanometer Beams	$427,356
03-ERD-046	Surveillance, Prediction and Insight for Decision making for Earliest Response (SPIDER)	$421,392
03-ERD-047	Hydrogen Storage in Carbon Nanotubes at High Pressures	$74,719
03-ERD-048	Long-range, passive detection of fissile material	$501,870
03-ERD-049	Identifying Gene Regulation Mechanisms using Rule Based Classifiers	$115,975
03-ERD-050	Carbon-nanotube permeable membranes	$267,056
03-ERD-051	Development of a Virtual Crystallizer	$652,358
03-ERD-052	Threat Analysis and Optimal Countermeasure Allocation	$126,887
03-ERD-058	Innovative Carbon Dioxide Separation Technologies	$299,208
03-ERD-059	Large-Aperture Diffraction Gratings, the Enabling Technology for High-Energy Petawatt Lasers	$633,687
03-ERD-060	Molecular Engineering of Electrodialysis Membranes	$373,088
03-ERD-061	Parallel Graph Algorithms for Complex Networks	$103,831
03-ERD-062	Microbial Pathways	$341,915
03-ERD-063	Protein Model Database	$99,958
03-ERD-064	A Two-Particle Formulation of Electronid Structure	$98,275
03-ERD-065	Environmental Transport and Fate of Endocrine Disruptors from Non-potable Reuse of Municipal Wastewater	$94,220
03-ERD-067	Nitrate Biogeochemistry and Reactive Transport in California Groundwater	$295,587
03-ERD-068	The Instrumented Cell	$400,528
03-ERD-070	Laser-Matter Interactions with a 527-nm Drive	$648,296
03-ERD-071	Optics Performance at 1 omega, 2 omega, and 3 omega	$518,280
03-ERD-072	Characterization and Optimization of High-Energy K-alpha X-ray Sources	$54,638
03-ERD-073	A Compact Accelerator For Proton Therapy	$62,124
03-ERD-074	Novel Methods for Bonding Disparate Materials	$191,945
03-ERD-076	Persistent Monitoring Platforms	$55,140
03-ERD-077	Plutonium and Quantum Criticality	$85,026
03-ERI-001	Tectonic Morphochronology of the Southern San Andreas Fault System	$199,436

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LLNL - L. Livermore National Lab

Project ID	Project Name	Total
03-ERI-002	A Next Generation Microlensing Survey	$89,358
03-ERI-003	A Computational Design Tool for an Integrated Micromixer and Components Used in Pathogen Detection Systems	$260,394
03-ERI-004	Elucidation of the Mechanism of Gene Silencing using Small Interfering Rna: Dna Hybrid Molecules	$61,101
03-ERI-005	Cellular Response to Heat Stress: System Stability and Eipgenetic Mechanisms	$59,999
03-ERI-007	Development of Sample Handling and Analytical Expertise for STARDUST Comet Sample Return Mission	$100,154
03-ERI-009	Force Spectroscopy to Study Multivalent Binding In Protein-Antibody Interactions	$23,925
03-ERI-010	Intracellular chemical measurements: A generalized approach with high-spatial resolution using functionalized nanoparticles	$21,374
03-ERI-011	Single Molecule Techniques for the Study of Chromatin Assembly and Remodeling	$24,389
03-ERI-012	Using femtosecond laser subcellular surgery as a tool to study cell biology	$33,996
03-FS-003	Developing Multilayer Mirror Technology near 45 nm using Scandium-Silicon Interfaces	$51,881
03-FS-004	Permeability Enhancement in Fine-Grained Sediments by Chemically Induced Clay Fabric Shrinkage	$74,887
03-FS-005	The Creation of Neutron Star Atmospheres on a Petawatt Laser	$74,545
03-FS-008	Single-Use Real-Time Bioweapons Detector	$47,418
03-FS-009	An Early Warning System To Detect Contamination of Municipal Treated Water	$74,744
03-FS-010	Silicon Nanocrystal Laser	$22,394
03-FS-011	Quantitative Carbon Isotope Ratio Measurements of Individual Cells	$73,892
03-FS-012	Single-Crystal Chemical-Vapor-Deposition Diamond: A Novel Material for Neutron Detection	$74,921
03-FS-018	The Search for Extra Dimensions : Probing Spacetime with Positronium	$74,565
03-FS-027	A New Material for NIF ICF Targets: Diamond-Like Polyimide	$74,408
03-FS-028	Feasibility of Proton Radiography for Mesoscale Characterization	$86,702
03-FS-029	Feasibility Study to Estimate the Person-to-Person Stability of mRNA Signatures of Radiation Exposure in Humans	$74,969
03-FS-030	Diode laser phase conjugation	$15,003
03-LW-001	A High Efficiency Grazing Incidence Pumped X-ray Laser	$215,110

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LLNL - L. Livermore National Lab

Project ID	Project Name	Total
03-LW-004	Resolving the Earthquake Source Scaling Problem	$190,458
03-LW-005	Space-Time Secure Communications for Hostile Environments	$189,789
03-LW-017	Mutations that Cause Human Disease: A Computational-Experimental Approach	$218,070
03-LW-020	Melting Studies of Simple Planetary Ices	$99,798
03-LW-024	Diode-Pumped Alkali Atom Lasers	$232,750
03-LW-027	Long-Time-Scale Atomistic Simulations	$145,680
03-LW-031	A Next-Generation Compton Imager	$152,615
03-LW-033	Ribozymes with Sequence Elements for Regulation of Expression	$188,109
03-LW-040	Optical Parametric Amplification in Photonic Crystals	$172,527
03-LW-047	Laser-Initiated Nanoscale Molecularly Imprinted Polymers	$185,205
03-LW-048	Covalent Attachment of Metallic Nanorods to Nanocrystals	$99,127
03-LW-056	Coherent Anti-Stokes Raman Microscopy: Specific Molecular In-Vivo Imaging at Super Resolution without Fluorescence Labels	$179,135
03-LW-059	A Novel Antimatter Detector with Application to Dark Matter Searches	$193,234
03-SI-001	Biological and Synthetic Nanostructures Controlled at the Atomistic Level	$1,484,237
03-SI-003	Image Content Engine	$799,862
03-SI-004	Advancing the Science and Engineering of Mesoscale Nondestructive Characterization	$562,502
03-SI-005	Pathomics	$2,121,096

Total # of Projects for LLNL: 210 **Total Cost for LLNL: $64,865,932**

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NTS - Nevada Test Site

Project ID	Project Name	Total
H1700003	Project Management	$351,292
H1701013	10-Gigabit/Second Fiber Optic Data Link	$139,385
H1701023	MCNP Evaluation and Enhancement	$73,030
H1701043	Framing Tube Design and Fabrication	$72,926
H1701063	Data Analysis and Visualization Tool	$151,215
H1701073	Magnetic Field Fiber Optic Sensor	$56,718
H1701093	Multi-frame Imaging VISAR	$35,448
H1701103	Multispectral X-ray Spectrometer	$89,815
H170111C	Ultrafast Velocity-based Triggering Systems	$1,492
H1701153	Tomography Scatter Correction	$30,315
H170201C	Applications for STLTs	$24,177
H1702023	Framing Tube Development	$157,454
H1702033	Metalization of Microchannel Plate Input Surface	$83,942
H1702043	Electrostatic Minifier Study	$28,491
H1702063	S-1 Photocathode Development	$90,342
H1702073	Low-Energy X-ray Radiographic Sources	$230,732
H1703013	Tailored Neutron Source	$67,974
H1703033	Particle Discriminating Activation Detector	$145,363
H1703043	Enhanced Accuracy Activation Systems	$93,228
H1703053	Fission Foil Angular Distribution Measurements	$68,302
H170305C	CAD, GIS and FIM Data Integration	$20,702
H1703073	MARXT HV Step Signal Generator	$175,118
H1703083	Multi-anode, High-bandwidth PMT	$78,920
H1703153	Compact Fabry-Perot Velocimeter	$205,609
H1704023	Real-Time Photogrammetric Mapping	$374,681
H1704033	Monte-Carlo N-Particle (MCNP) Modeling, Simulation, Training, and Improvement	$81,262
H1704093	Tube-less Neutron Sensor in a Mixed Gamma and Neutron Field	$68,882
H1704103	Portable Gamma-Ray Detectors with Directional Sensitivity	$108,728
H1704133	Gamma and Neutron Detection with Cd and Gd coupled with NaI	$22,744

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NTS - Nevada Test Site

Project ID	Project Name	Total
H170416C	Development of a BRDF Normalization Model	$23,750
H1704193	Rapid In-the-Field Calibration of In-Situ HPGe Gamma Spectrometers	$47,652
H1704203	6Li(Ce) Glass Fiber Neutrons and Gamma Detection System	$100,068
H1704233	Combination Neutron and Gamma Ray Detector	$61,849
H1704353	RF Detection of High Explosive Materials	$51,819
H1705023	Airborne Communicable Viral Pathogen Sensor	$90,098
H1705043	Multi-Channel Radio Frequency CDMA Data Communications	$32,795
H1705063	Survey of Covariance Mapping and Statistical Image Enhancement	$27,659
H1705073	Capacitive Proximity Imaging System	$50,144
H1705083	Fiber-Coupled VISAR	$144,707
H1705093	Flexible Short-Range Communications Network	$37,919
H1705103	Gamma and Neutron Counter	$26,479
H1705153	Heat-Stimulated Lithium Niobate X-Ray Source	$48,440
H1705173	Low-Frequency Radio Wave Motion Sensing	$87,592
H170518C	Compact Intensified Camera	$9,489
H1705193	New Radiation Detection Scheme	$44,823
H170520C	Laser Automatic Gain Control	$17,723
H1705273	Handheld Direct-view Thermal Imager	$35,734
H1705283	UV LIDAR Telescope for Remote Sensing	$77,347

Total # of Projects for NTS: 48 **Total Cost for NTS: $4,144,374**

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ORNL - Oak Ridge National Lab

Project ID	Project Name	Total
3210-2010	A Novel Device for Quantitative Single-Atom Detection of Carbon-14	$25,009
3210-2021	Simulation of Biomolecular Complexes: Advanced Computational Sciences at the Molecular Level	$20,164
3210-2023	A Novel Technique for Infrared Imaging	$5,172
3210-2024	Carbonation of Serpentine for Long-Term Carbon Dioxide Sequestration	$19,580
3210-2028	Development of a Generic Computational Method for Biological Data Clustering	$29,985
3210-2029	High-Resolution, Real-Time, Three-Dimensional Imaging Using Two-Wavelength Spatially Heterodyned Interferomety	$29,989
3210-2031	A New Microwave-Driven Pack Cementation Coating Process	$40,905
3210-2032	Nanostructures for Spatially Resolved Macromolecular Delivery to Viable Whole Cells	$19,504
3210-2033	Online Characterization of Individual Airborne Bacteria	$5,495
3210-2036	A Miniature Electrostatic Molecular-Ion Storage Ring	$32,529
3210-2038	Ultrasonic Processing of Ultrafine Materials	$60,756
3210-2039	Compound Semiconductors on Silicon: Shedding Some Light on Matter	$55,952
3210-2041	Signal Processing Architectures for Maskless Lithography	$49,987
3210-2042	Predicition of Sepsis Onset in Trauma Victims Using Advanced Nonlinear Analysis of Time-Serial Physiological Data Including Heart Rate Variability	$10,476
3210-2045	Genetic Variation in Cellular Responses to Low-Dose Radiation	$51,969
3210-2046	Ultrafast-Laser-Produced Radioactive Ions	$34,822
3210-2048	Density Matrix Renormalization Group for Interacting Fermions	$29,819
3210-2049	Ferromagnetism in Dilute Magnetic Semiconductors: Getting to the Science with Neutron Scattering	$100,016
3210-2050	Engineered Entanglement in Two-Photon States	$94,378
3210-2051	Cardiopulmonary Resuscitation Using Optimal Control	$48,845
3210-2052	Photomolecular Comb	$70,741
3210-2053	Growth of Magnesium Diboride Thin Films for Superconductor Applications	$9,432
3210-2054	Fluorescence-Based Coatings Diagnostics	$9,398
3210-2056	Metabolic Profiling: A Required Element in Functional Genomics	$68,193
3210-2057	Nanoelectronic Devices Made From Doped Nanofibers	$96,079
3210-2058	Protein Surface Mapping by Chemical Oxidation and Mass Spectrometry	$109,731
3210-2059	Ultraviolet Electroluminescent Device Development	$40,977

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Project ID	Project Name	Total
3210-2060	Light-Emitting Nanoscale Tunnel Junctions	$19,333
3210-2061	Highly Reflective Subwavelength Structures for Homeland Security Initiatives	$13,401
3210-2062	Dynamic Transport in Nanostructures	$124,756
3210-2063	Variance Reduction Tools for Making Monte Carlo Radiation Treatment Planning Clinically Useful	$124,965
3210-2064	A New Approach to Chemical Detection: Infrared Coherent Anti-Stokes Raman Scattering	$115,752
3210-2065	Novel Platinum Support for Proton-Exchange-Membrane Fuel-Cell Cathode and Anode Active Layers	$90,208
3210-2066	Identifying a Suitable Methodology to Extract Meaningful Resultsfrom Dose Volume Histograms using Statistical Analysis	$53,871
3210-2067	Nanocrystalline Giant Magnetostrictive Materials for Microactuator Applications	$60,449
3210-2068	Automated Image Analysis for Functional Genomics	$122,801
3210-2069	Development of a New High-Temperature Proton-Electron Mixed Conductor for Hydrogen Separation	$104,926
3210-2070	Probing Charge Transport in Oriented Polymer Nanostructures: Toward Integrated Molecular-Scale Optoelectronics	$80,968
3210-2071	Developing a New Core Competency for ORNL: Macromolecular Neutron Crystallography	$124,879
3210-2072	Proof-of-Principle Test for Endophyte-Mediated Effect on the Uptake of Metals by Tall Fescue	$14,947
3210-2073	Gold Nanocrystal Sensors/Concentrators for Chemical Weapons Agents	$19,936
3210-2074	Selective Area Chemical Vapor Deposition of Carbon Nanotube Films Using Seeded Molecular Beams	$59,961
3210-2075	Novel Treatment for Biological Warfare Pathogens	$124,947
3210-2076	Permeable Environmental Leaching Capsules (PELCAPs) for Nondestructive In Situ Evaluation of Contaminant Immobilization in Soil	$75,306
3210-2077	High-Tc Silicon-Compatible Ferromagnetic Semiconductors	$92,976
3210-2078	Development of Readout Electronics Architecture for Silicon Strip Vertex Detector Upgrade to the PHENIX Experiment	$93,157
3210-2079	Controlling Size and Function of Metal Oxide Nanoparticles:Coupling Micellar Nanoreactor Synthesis, and Hydrothermal Processing	$83,185
3210-2080	Synthesis of Highly Textured Ternary Carbide Compounds for Power Generation and Other Industrial Applications	$70,159

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Project ID	Project Name	Total
3210-2081	An Innovative Technique for Bi-Material Interface Toughness Research	$45,071
3210-2082	Ontology-Based Three-Dimensional Modeling for Human Anatomy	$74,310
3210-2083	Nanoporous Inorganic Membranes for High Selectivity Hydrogen Separations	$35,000
3210-2084	High-Aspect Ratio Carbon Nanofiber Probes for Scanning Probe Microscopy	$64,649
3210-2085	Construction of a Gene-Prediction Algorithm in Populus: Adding a New Dimension to Complex Biology	$59,994
3210-2086	Enhanced Biological Hydrogen Production Using Three Phase Systems	$19,855
3210-2087	In Situ Studies of Hydrogen Storage Materials Using Neutron Scattering	$24,310
3210-2088	Toward Neutron Star Merger Simulations: Gravitational Waves, Heavy Element Nucleosynthesis, and Gamma-Ray Bursts	$24,923
3210-2089	Micro- and Mesoscale Strain Measurements in Cement-Based Materials	$21,736
3210-2090	Investigation of the Tribological Properties of Graphitic Foam Reinforced Carbon-Carbon Composites	$19,738
3210-2091	Development of a Three-Dimensional Radioisotope Depletion Method Using Monte Carlo Transport	$29,958
3210-2092	Zero-Loss Fiber Optic Splitter	$54,984
3210-2093	Alanates for High-Capacity Hydrogen Storage	$12,690
3210-2094	The Global Optimization Problem for Remote Sensing: A Guaranteed, Efficient Solution	$29,813
3210-2095	High-Speed Decay Lifetime Analysis Using Field Programmable Gate Arrays	$16,669
3210-2096	Sounds of Rapids as an Attractant for Migratory Fish	$19,691
3210-2097	Robust Segmentation of Telomeres in Metaphase FISH Images	$19,999
3210-2098	Tailoring the Properties of Crystalline Solid Solutions by Magnetic and Stress Annealing	$18,979
3210-2099	High Effective Hydrogen Storage Density	$12,692
3210-2100	Metallic Nano-Fuels for Vehicles	$7,357
3210-2101	Enhancing Performance of Hydrogen Storage Materials through Nanoscale Design	$9,059
3211-2015	Nanoscale Photosynthesis, the Photophysics of Neural Cells, and Artificial Sight	$200,593
3211-2016	Creating Oxygen-Rich Nanoclusters for High-Temperature Strengthening of Structural Alloys	$18,738
3211-2024	Nanoscale Explosive-Energy-Burst Generators Using Controlled Nuclear-Mechanical Triggering of Pretensioned Liquids	$19,519

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Project ID	Project Name	Total
3211-2025	Combined Neutron and X-Ray Diffraction	$129,914
3211-2026	Synthesis of High-Performance Algorithms for Electronic and Nuclear Structure Calculations	$309,949
3211-2027	Cellular Algorithms for Next-Generation High-Performance Cellular Architectures	$249,976
3211-2028	Scalable Tools for Petascale Distributed-Data Analysis	$335,038
3211-2029	Community-Wide Analysis of Unique Sequences and Functions from Uncultured Microorganisms	$201,345
3211-2030	Elucidating Eukaryotic Gene Regulatory Networks	$346,564
3211-2031	High-Throughput Analysis and Modeling of Protein Complexes	$154,945
3211-2032	Protein Microarray Interactions Readout using Stepping Sampling Probe/Electrospray Mass Spectrometry	$238,984
3211-2033	Reactive Membranes for Clean Coal Technologies	$218,101
3211-2034	Innovative Safety Technologies for Generation IV Reactor Designs	$279,553
3211-2035	Enhanced Performance and Energy Savings Through Ultrahigh Magnetic Field Processing of Ferromagnetic Materials	$297,952
3211-2036	Remote Emission Sensor Technology for Heavy-Duty Truck Emissions	$322,493
3211-2037	Advanced High-Temperature Test Loop For Materials Compatibility in Advanced High-Temperature Reactors	$224,693
3211-2038	Electrical Conductivity at the Nanoscale	$278,947
3211-2039	Structure and Dynamics of Fluids in Confined Geometries	$279,284
3211-2040	Self-Organized Copolymer and Nanoporous Oxide Thin-Film Templates for Controlled Synthesis and Periodic Replication of Nanoscale Materials	$283,855
3211-2041	Multifunctional Nanotube Composites	$338,139
3211-2042	Nanoscale Photonic Crystal Laser	$331,438
3211-2043	Multiscale Modeling and Simulation of the Growth and Functionalization of Nanotube Crystals, Arrays, and Polymeric Composites	$192,884
3211-2044	Development of Time-of-Flight Capabilities for Studies of Inelastic Neutron Scattering and the Dynamics of Soft Matter	$232,582
3211-2045	Detector Development for Fundamental Neutron Physics at the Spallation Neutron Source	$249,785
3211-2046	Three-Dimensional Neutron Structural Microscopy:Design, Simulation, and Demonstration	$218,412
3211-2047	Simulation of Subsurface Environmental Processes	$209,268

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Project ID	Project Name	Total
3211-2049	Elucidating the Functions of Genes and Pathways That Contribute to Genomic Instability, Cell Death, and Malignancies in Mouse Models with Telomere Dysfunction	$284,468
3211-2050	Identification and Characterization of Genes and Protein Components in Cell-Cycle Control and Cancer Development	$279,921
3211-2053	Ecosystem Genomics-An Emerging Opportunity for Environmental Research	$102,073
3211-2057	Neutron-Rich Radioactive Ion Beam Production with High-Power Electron Beams	$75,858
3211-2058	Scaling Climate Models for Future Computer Architectures	$249,659
3211-2059	Advanced Computational Methods	$399,948
3211-2060	Genomic Characterization of Belowground Ecosystem Responses to Climate Change	$289,601
3211-2061	Self-Organizing Polymers as Biomaterials	$314,113
3211-2062	Materials Science of Nanostructured Carbon and Graphite	$262,381
3211-2063	Aberration-Corrected, Ultra-High-Resolution Electron Microscopy for Atomic-Level Characterization of the Structure and Chemistry of Nanophase Materials	$264,745
3211-2064	Biologically Driven Controlled Synthesis and Directed Assembly of Nanophase Materials	$257,687
3211-2065	Creating New Climate Drivers and Interactions in Global Climate Models	$350,206
3211-2066	Biomolecular "Locks and Keys" High-Performance Computing for Investigation of Recognition Principles in the Complexes of Biological Macromolecules	$164,990
3211-2067	Toward Common Components for Computational Nanoscience	$276,745
3211-2068	Comprehensive Molecular Probing of Live Biological Cells	$255,016
3211-2069	Selective Catalytic Oxidation	$106,945
3211-2070	Zero-Power, Low-Cost Sensor Platform	$225,660
3211-2071	Intelligent Consequence Management for Energy Assurance	$221,915
3211-2072	Breakthrough Multi-Megawatt Space Reactor Power System Design	$344,227
3211-2073	Distributed Intrusion Detection and Attack Containment for Organizational Cyber Security	$223,189
3211-2074	Image to Intelligence Archive:Intelligent Agent-Based, Large-Scale, Spatial-Data Management and Analyses	$381,122
3211-2075	Advanced Ion Trap Mass Spectrometry for the Rapid and Confident Identification of Biological Agents	$319,664
3211-2076	NEUTROMEGAS: A Pixel Detector for Neutron Imaging	$238,490

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ORNL - Oak Ridge National Lab

Project ID	Project Name	Total
3211-2077	Nanoscale Control of Collective Phenomena Using Artificially Structured Materials	$45,000
3211-2078	Scalable Visualization Tools and Technologies	$81,426
3211-2079	Materials Needs for Successful Implementation of Lean NOx Treatment Technology	$53,577
3211-2080	Production of Hydrogen Using Nuclear Energy and Inorganic Membranes	$150,135
3211-2081	Probing Explosive Nucleosynthesis Through Measurements at the Holifield Radioactive Ion Beam Facility	$89,095

Total # of Projects for ORNL: 123 **Total Cost for ORNL: $15,933,070**

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	Total
PN01007/1507	Atmospheric Flow Reactor Chamber for Gas Phase Kinetics	$78,757
PN01017/1517	Demonstration of Ultrasound for the Characterization of Microbial Biofilm Structure and Growth	$74,805
PN01025/1525	Diagnostic Non-Radioactive and Long-Lived Radionuclides by Inductively Coupled Plasma Mass Spectrometry	$47,186
PN01032/1532	Fermentation Development Using Filamentous Fungi	$224,659
PN01037/1537	Majorana Sensitivity Study	$163,787
PN01039/1539	Mesoscale Material Modeling for Prognostics	$115,005
PN01040/1540	Methods for Determining Structure and Bonding in Molecules Containing Actinide Elements and Technetium	$104,847
PN01045/1545	Modified Carbon Supports for Aqueous Phase Catalysis	$87,944
PN01050/1550	Nanoparticle-Based Materials for Microanalysis	$131,990
PN01052/1552	Nonuniform Memory Access Algorithms and Infrastructure for Image Processing	$173,416
PN01058/1558	Organism Discovery for Fermentation Using Filamentous Fungi: Reference Collection and Screening	$105,715
PN01067/1567	Regulated Processing of Cytokines and Growth Factors at the Cell Surface	$248,869
PN01072/1572	Single-Molecule Study of Protein-Protein Interaction Mechanisms and Dynamics in Cell Signaling	$197,395
PN01077/1577	Synthesis and Characterization of Chemically Tailored Monolithic Nanoporous Thin Films using Molecular Beam Techniques	$216,319
PN01079/1579	Synthesis and Characterization of Novel Nanocrystalline Oxide Film Structures	$253,045
PN01080/1580	Synthesis of Novel Nanocluster-Based Materials	$30,001
PN02001/1589	A Protein Functional Analysis for Information Integration	$186,381
PN02002/1590	Actinide Coordination Chemistry for Advanced Separations Technology	$125,002
PN02004/1592	Advanced Meteorological Modeling for Applied Dispersion Models	$34,971
PN02005/1593	Advanced Subsurface Software for Subsurface Science	$254,252
PN02007/1595	Algorithms for Quantitative Multidimensional Spectral Analysis	$44,977
PN02009/1597	Autonomous Robotic Controls	$74,820
PN02010/1598	Bayesian Nonlinear Regression Modeling for Remote Sensing Applications	$85,333

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	Total
PN02012/1600	Carbon Sequestration and Production of Chemical Feedstocks With Artificial Photosynthesis	$83,500
PN02013/1601	Characterization of Shewanella Oneidensis MR-1 Genes Involved in Environmental and Cell-Cell Sensing	$329,369
PN02015/1603	Computational Cell Environment	$358,338
PN02016/1604	Design and Simulation of the Future Integrated Energy System	$247,645
PN02017/1605	Detection of the Sources of Atmospheric and Nuclear Explosion Particulate Matter	$88,522
PN02018/1606	Development of a Distributed Land Surface Hydrology-Biogeochemistry Model	$47,201
PN02020/1608	Development of Advanced Proteomic Methods and Their Application to the Analysis of Human Cytomegalovirus	$210,063
PN02021/1609	Development of Damage and Optimization Tools for the Design of Short-Fiber Thermoplastic Hybrid Composite Structures	$197,922
PN02022/1610	Development of Data Mining Capabilities for Proteome-Wide Analyses	$169,968
PN02028/1616	Epidermal Growth Factor Receptor Signaling and Related Protein-Protein Interactions	$140,008
PN02029/1617	Epitaxial Growth and Properties of Nanoscale Oxides for Spintronics	$401,915
PN02030/1618	Evaluation of Crystal Fate in Cold Crucible Induction Melter Glass Processing	$33,842
PN02033/1621	Filamentous Fungal Genetics	$249,279
PN02035/1623	Disposal of CO2 in Sedimentary Rock Formations	$258,988
PN02035/1623-A	Disposal of CO2 in Gas Hydrate Formations	$69,995
PN02035/1623-B	Disposal of CO2 in Basalt Formations	$74,687
PN02036/1624	Identification of Specific Tyrosine Phosphorylations Associated with Activation of Oncogenic Signaling Pathways	$170,263
PN02037/1625	Image Registration Scheme Using Hough Transform	$209,985
PN02039/1627	Kinetic Simulations and Network Analysis: The EGF Receptor Signaling Network	$201,401
PN02040/1628	Knowledge Discovery and Data Mining of Scientific Data Sets	$119,931
PN02041/1629	Microscopic and Spectroscopic Analyses of Iron Reduction by Shewanella oneidensis MR-1	$229,992
PN02043/1631	Natural Three-Dimensional Hand Tracking	$9,979

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	Total
PN02044/1632	Nondestructive Characterization of Life-Limiting Degradation of Nuclear Reactors	$93,276
PN02048/1636	Particulate Matter Emissions Aftertreatment Modeling	$125,971
PN02049/1637	Partitioning Tracer Related Technology Development for Tank Leak Detection, Monitoring, and Mitigation	$50,601
PN02051/1639	Proteomics of Morphology Determination in a Fungus	$58,764
PN02053/1641	Quantum Calculations for Systems With 104-105 Atoms: Application to Nano-Materials and Biochemical Reactivity	$148,693
PN02054/1642	Radiation-Induced Bystander-Dependent Regulation of Cell Transformation Response	$29,916
PN02056/1644	Risk and Impact Assessment Metrics for Carbon Sequestration Solutions	$21,993
PN02061/1649	Simulating the Climatic Effects of the Asian Brown Cloud	$42,063
PN02062/1650	Simulation Methodology Development for an Energy Transmission and Distribution System	$201,198
PN02063/1651	Single Chain Monoclonal Antibodies (scFv): A Versatile Source of Antigen Specific Reagents	$225,007
PN02064/1652	Single Molecule Approach for Understanding Epidermal Growth Factor Receptor Interactions	$258,043
PN02069/1657	Synthesis Techniques and Characterization of Nanostructured Organic-Inorganic Hybrid Systems	$208,939
PN02070/1658	Three-Dimensional Object-Based Characterization and Analysis	$344,276
PN02071/1659	Use of Satellite Imagery and Three-Dimensional Computational Fluid Dynamics Models to Remotely Quantify Water Quality Variations in the River/Reservoir Environment	$32,909
PN02073/1661	Virtual Test Reactor for Materials	$27,360
PN02075/1663	Yttrium-90 Fibrin Composites for Treating Minimum Residual Disease	$83,188
PN03001/1664	A Molecular-Level Description and Sensitivity Analysis for Improved Modeling of Aerosol Nucleation and Growth in Global Climate Models	$114,086
PN03002/1665	A Scalable Architecture for Content-Based Information Discovery	$117,394
PN03003/1666	Adaptive Data Integration Middleware for Dynamic Information Discovery	$183,237
PN03004/1667	Advanced Information Analysis and Processing	$36,902
PN03005/1668	Advanced Radiochemical Analyses	$171,720

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	Total
PN03007/1670	Affinity Reagents for Surface Functionalization	$60,204
PN03008/1671	Apatite Formation Using Calcium Ascorbate	$9,215
PN03009/1672	Atomically Resolved Imaging of Si(111)-(7×7) and TiO2(110)-(1×1)	$35,019
PN03010/1673	Atomic-Level Simulations to Interpret Neutron Scattering Data for Materials	$25,138
PN03011/1674	Boron Systems for Hydrogen Storage	$27,079
PN03012/1675	Brazing Techniques for Dense High Fired Alumina Ceramics	$48,955
PN03013/1676	Carbon-Carbon Composite Electrically Enhanced Sorption for Carbon Dioxide Separations	$49,889
PN03014/1677	Climate Change Chemistry of Atmospheric Particles	$59,758
PN03015/1678	Communications Analysis	$40,578
PN03016/1679	Computational Catalysis	$92,895
PN03017/1680	Concept-Based Document Analysis: Human-Centered Information Discovery	$60,151
PN03018/1681	Cooperative Multiagent System for Data Mining and Fusion	$91,953
PN03019/1682	Data Anamoly and Signature Detection with Associated Data Utility Development	$49,782
PN03020/1683	DC-STREAMS: Detecting Change in Continuous, Time-Varying Data Streams	$122,947
PN03021/1684	Detection of Chemical Weapon Related Chemicals in Rivers and Coastal Environments Using Bivalves	$86,930
PN03022/1685	Determination of Failure Probability Correlations for Estimating the Effect of First-Principles Prognostics on Reactor Operational Risk	$61,263
PN03023/1686	Development and Demonstration of Statistical Summarizing and Visualization of Data Used to Support Risk Decision Making	$29,402
PN03024/1687	Development of a Salmonid Based DNA Microarray for Toxicological Testing of Environmental Contaminants	$82,172
PN03025/1688	Development of a Sensor to Monitor Swimming Activity of Fish	$15,014
PN03026/1689	DNA Microarrays for Monitoring Chemically-Induced Stress in Chiromonas tentans	$54,654
PN03027/1690	Domain Specific Architecture for Intelligence Analysis	$142,165
PN03028/1691	Electrode Structures for High Pressure Xenon Detectors	$43,914
PN03029/1692	Electronic Structure of Organic Light-Emitting Diode Materials	$101,413
PN03030/1693	Elucidating Cell Signaling Networks in Shewanella oneidensis MR-1	$179,527

PNNL - Pacific Northwest National Lab

Project ID	Project Name	Total
PN03031/1694	Enhanced Measurements of Submicromolar Concentrations of Pu in Solution Via Spectrophotometric Detection of Plutonium(VI)	$64,703
PN03032/1695	Evaluation of the Reforming Characteristics of Various Biomass-Derived Feedstocks in Producing Hydrogen for Fuel Cells	$63,240
PN03033/1696	Fermentation of Lignocellulose to Ethanol by Filamentous Fungi	$150,358
PN03034/1697	Framework for Climate Modeling using Super Parameterization Techniques	$138,567
PN03035/1698	Free Hydrogen Detection and Quantification by Gas-Coupled Ultrasound	$7,154
PN03036/1699	Functionalization of Nanostructures for Chemical Conversions of Importance in Biobased Processing	$34,961
PN03037/1700	Heuristic Entity Relationship Building Environment	$278,482
PN03038/1701	High Performance Nuclear Separation and Preconcentration with Chemically Selective Mesoporous Structures	$43,835
PN03039/1702	Highly Selective Monolayer Sorbents for Advanced Analytical Applications	$125,088
PN03040/1703	High-Speed, Three-Dimensional Visualization of Intercellular and Intracellular Signal Transduction in Complex Cell Structures	$257,233
PN03041/1704	Hydrogen Pathways and Analysis of Energy, Economic, and Environmental Implications	$30,943
PN03042/1705	Hydrogen Storage Concepts	$81,525
PN03043/1706	Identification and Analysis of Hidden Multi-Relational Links	$146,276
PN03044/1707	Implementation of Parallel Solver in Coupled Fluid, Energy, and Solute Transport Computer Code	$45,585
PN03045/1708	Imprinted Media for Highly Selective Separation of Explosives, Chemical Warfare Agents, and Biological Warfare Surrogate Organisms	$165,459
PN03046/1709	In Situ Magnetic Resonance Investigations of Metabolism and Mass Transport in Biofilms	$189,308
PN03047/1710	In Situ Spatial Analysis of Expression in Bioreactor Granule Microbial Communities	$260,929
PN03048/1711	Influence of Gd and Sm Doping on Atomic and Ionic Transport Properties of Novel Nanostructured Ceria-Zirconia Multilayers	$124,718
PN03049/1712	Influence of Surface Thermodynamic Properties on Bacterial Transport in Variably Saturated Porous Media	$25,685
PN03050/1713	Infrared Detection of Organics in Artificial Aging Experiments	$22,276
PN03051/1714	Investigation of Bicyclic Diamides and Their Use in Separations	$58,159

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	Total
PN03052/1715	Knowledge Signatures for Integrated Information Management	$160,525
PN03053/1716	Life-Limiting Degradation Mechanisms in Current Light-Water and Advanced Concept Reactors	$96,273
PN03054/1717	Microanalytical System for Detection of Explosives and Organophosphates	$54,009
PN03055/1718	Modeling of Power Systems as Complex Adaptive Systems	$35,299
PN03056/1719	Multilayer Thin Film Separation Membranes	$6,980
PN03057/1720	Multiple Sensor Data Integration and Decision Analysis - Chemical Signature Detection	$99,021
PN03058/1721	Multiple Sensor Data Integration and Decision Analysis - Nuclear Signature Detection	$74,135
PN03059/1722	Neutron Detector Research	$24,367
PN03060/1723	Neutron Scattering to Determine Biomolecular Conformations on Biosensor Surfaces	$2,953
PN03061/1724	Neutron Scattering to Probe Disorder in Protein Complex Formation	$23,944
PN03062/1725	Neutronic Calculations to Support Advanced Hybrid Fuel Development	$24,796
PN03063/1726	New Thin-Film Electroactive Materials for Enhanced Separations	$59,290
PN03064/1727	Nondestructive Measurement of Sediment Mechanical Properties to High Pressure	$16,744
PN03065/1728	Novel Nanocatalysts -- Glycosidase Mimetics	$41,429
PN03066/1729	Novel Nano-Structured Catalysts	$65,098
PN03067/1730	Novel Near-Infrared Laser Absorption Spectrometer Development	$36,823
PN03068/1731	Ionization Mass Spectrometry	$99,233
PN03069/1732	Optically Stimulated Luminescence-Based Passive Gamma Ray Spectrometer	$54,974
PN03070/1733	Organic Synthesis Using Plasma-Facilitated Catalysis	$129,891
PN03071/1734	Organism Identification Using Reverse Chemistry Arrays	$222,086
PN03072/1735	Parallel Computing Methods for Surface Water Flow and Transport	$41,549
PN03073/1736	Peptide Permutation and Protein Prediction	$207,351
PN03074/1737	Periodic Structures Using Standing Ultrasonic Waves	$70,063
PN03075/1738	Preconcentration of Organic Signatures Based on Carbon Nanotube Composites	$93,877
PN03076/1739	Radio Frequency Tag Technology for Tracking Site Fidelity of Wild Animals	$39,958
PN03077/1740	Rare Gas Isotopic Signature Evaluation of Actinide Contaminant Sources	$55,976

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	Total
PN03078/1741	Real-Time Detection and Multidimensional Characterization of Single Air-Borne Microorganisms	$44,953
PN03079/1742	Regenerable Sorbents for Carbon Dioxide Capture Based on Functionalized Nanomaterials	$125,288
PN03080/1743	Risk Hazard-Risk Measure Methodology Functionality Upgrade for Rapid Implementation on Risk-Based Accelerated Clean-Up Strategies	$53,804
PN03081/1744	Scenario and Knowledge Framework for Analytical Modeling	$227,234
PN03082/1745	Sensor and Tracer Technology for Characterization of Ultra-Low CO2 Leakage Fluxes and Pathways	$109,238
PN03083/1746	Single Enzyme Nanoparticles on Nanostructured Matrices	$179,977
PN03084/1747	Sonoluminescence Assisted Degradation of Recalcitrant Hydrocarbon Compounds in Aqueous Matrices	$33,862
PN03085/1748	Sonoluminescence Following Acoustically Driven Bubble Collapse	$94,731
PN03086/1749	Stress-Activated Control Mechanisms Underlying Signal Transduction Networks	$344,306
PN03087/1750	Structure Determination of Biomineralization Proteins Using Neutron Scattering	$35,163
PN03088/1751	Supercritical Fluid Extraction of Bacterial Spores and Analysis for Specific Biomarkers	$108,039
PN03089/1752	Surface Functionalization for Biorecognition	$66,986
PN03090/1753	Synthesis and Characterization of Novel Nanoporous Transition Metal Phosphates with Inherently High Anion Adsorption Properties	$35,979
PN03091/1754	Transcriptional Profiling of Microbial Syntrophic Systems	$165,937
PN03092/1755	Ultrasonic Measurement of Flow in Microchannels	$40,026
PN03093/1756	Using Direct Numerical Simulations of Boundary Layer Turbulence to Improve Atmospheric Emergency Response Models	$24,008
PN03094/1757	Using High Frequency Pulsed Ultrasound at Sub-Cavitation Conditions as a Mechanism to Enhance Energy Efficiency and Selectivity in Heterogeneous Catalytic Chemistry	$74,068
PN03095/1758	Validation of scFv Antibodies for Identification of Protein Complexes	$164,221
PN03096/1759	Virtual Environments in n-Dimensions for Analysts	$72,009

Total # of Projects for PNNL: 156 **Total Cost for PNNL: $17,258,779**

PTX - Pantex Plant

Project ID	Project Name	Total
PX01001	Proximity Tracking Capability	$675,228
PX01004	Thermally Stable High Explosive for Booster Applications	$20,745
PX01005	Clustering Data Processing	$14,859
PX01008	Compatibility and Modeling of Solvents with Metals and Alloys Used in Weapons	$61,385
PX01009	Circuitry Analysis to Produce Work Area Voltage Profiles Generated by Lightning Flashes	$136,979
PX01010	Solvent Recovery and Reuse from Synthesis and Formulation Processes	$77,650
PX01012	Processing and Aging of Explosives and Binders Studied by Laser Raman Spectroscopy	$65,094
PX01013	Development of a Laser-Based Methodology for Inside Shape Measurements	$368,587
PX01015	Explosive Synthesis & Formulation Process Optimization by Computer Modeling	$346,979
PX02001	Robotic Pit Handling & Packaging	$148,287
PX02002	Advanced Leak Detection System	$52,854
PX02003	Establish a Computational Capability at Pantex for Modeling Organic Compounds for Stockpile High Explosives and Design Agency Research Explosives	$336,433
PX02006	Alternate Explosive Destruction Technology Demonstration	$45,677
PX02007	3D Imaging System	$39,351
PX02009	Thermal Modeling of Pit Storage Areas	$226,894
PX02011	3D Acoustical Resonance System	$61,589
PX02015	Development and Implementation of an Enhanced Chemical Reactivity Test	$99,434
PX02016	Application of Chemical Force Microscopy to Determine the Strength of Bonds between High Explosives and Binders	$84,871
PX02017	Biometric Authentication	$19,515
PX02020	Non Contact Measurement and Infrared Temperature Imaging of Explosives	$68,570
PX02021	Fiber Optic Isolation for RF Testers	$78,977
PX03001	High-Precision Non-Contact White Light Digitizing Sensor	$16,296
PX03002	Enhanced Analysis Capability Supporting Accelerated Aging Studies	$684,956
PX03004	Formation and Detection of Pores in Polymeric Materials	$205,621
PX03005	Establishment of a High Explosive Explosives Powder Pattern Library	$202,962
PX03006	GMR Eddy Current System	$90,529

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PTX - Pantex Plant

Project ID	Project Name	Total
PX03007	PT4188 Modular Telemetry Test System	$486,809
PX03008	Neutron Non-Destructive Imaging of Weapons Materials	$300,611
PX03009	Validating Ultra Sonic Output for Positional Accuracy	$45,352
PX04009	Classified Weapon Decision Support System	$200

Total # of Projects for PTX: **30** **Total Cost for PTX:** **$5,063,294**

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SNL - Sandia National Lab

Project ID	Project Name	Total
11130	Molecular Integrated Microsystems (MIMS)	$814,753
26508	Mesoscale Wide-Bandwidth Linear Magnetic Actuators	$294,912
26509	Levitated 3-Axis Microaccelerometer	$308,690
26510	Microfabrication Processes combining Focused Ion Beam Machining and Thin Film Vapor Deposition Techniques	$278,149
26511	Resolving Fundamental Limits of Adhesive Bonding in Microfabrication	$261,054
26512	Parallel Atomistic Computing for Failure Analysis of Micromachines	$175,649
26514	Smart Sensor Technology for Joint Test Assembly Flights	$302,785
26515	Multilevel Methods for Nonlinear Structural Mechanics	$179,235
26516	Algorithmic Support for Commodity-based Parallel Computing Systems	$243,069
26517	Parallel Repartitioning for Optimal Solver Performance	$242,807
26518	III-Antimonide/Nitride Based Semiconductors for Optoelectronic Materials and Device Studies	$403,977
26519	The Integration of Advanced Photonics and MEMS	$428,018
26520	Uncertainty Propagation in Models of Thermo-Fluid Systems	$213,144
26521	Filtered Rayleigh Scattering Diagnostic for Multi-Parameter Thermal/Fluids Measurements	$344,335
26522	A Physically-based Approach to Modeling Ductile Fracture	$263,078
26523	Radiation Aging of Stockpile and Space-based Microelectronics	$268,999
26524	Large Deformation Solid-Fluid Interaction via a Level Set Approach	$276,888
26525	Magnetic-Field Effects on Vacuum-Arc Plasmas	$215,852
26526	Microstructural and Continuum Evolution Modeling of Sintering	$245,976
26527	Assuring Ultra-Clean Environments in Micro-system Packages: Irreversible and Reversible Getters	$373,595
26528	Biocompatible Self-Assembly of Nano-Materials for Bio-MEMS and Insect Reconnaissance	$342,134
26530	First-Principles Determination of Dislocation Properties	$167,868
26531	Air Sterilization and Decontamination	$81,954
26532	Data Fusion and Visualization of MASINT Results for Underground Facility Characterization	$183,041
26534	Advanced Unattended Ground Sensor Technology	$198,894
26535	The Endowment of Simulator Agents with Human-Like Episodic Memory	$175,893

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SNL - Sandia National Lab

Project ID	Project Name	Total
26539	Algorithms for Improved Performance in Cryptographic Protocols	$175,575
26540	Low Cost Digital Radar for Fuzing, Tags, SAR Imaging, and Targeting	$266,983
26543	Adaptive and Mobile Ground Sensors	$311,724
26544	Algorithm Development for Prognostic Health Monitoring & Maintenance	$267,424
26545	New Mechanism for Upset of Electronics	$158,745
26546	Flexible Robotic Maintenance Facility	$321,051
26548	Obstacle Detection for Autonomous Navigation	$344,673
26551	Novel Catalytic Systems for Energy Efficient Feedstock Hydrocarbon Separations	$311,552
26552	A Model of Infrastructure Interdependency Using Communication Agents	$350,057
26553	Micro-Chemical Sensors for Characterization and Monitoring of Volatile Contaminants	$374,404
26554	Investigation of Potential Applications of Self-Assembled Nanostructured Materials in Nuclear Waste Management	$303,927
26555	Development of Detection Techniques and Diagnostics for Airborne Carbon Nanoparticles	$130,841
26557	Specific Anion Nanoengineered Sorbents for Water Purification	$348,917
26563	Advanced Digital Detectors for Neutron Imaging	$201,222
26564	Microfabricated Acoustic Spectrum Analyzer	$443,162
26572	Coating Chemical Preconcentrators to Improve Chemical Agent Collection	$182,982
26574	Detection and Exploitation of Spread-Spectrum Waveforms	$512,719
26577	Robust Chemometrics for Remote Spectral Sensing	$268,851
26578	Deployable Large Aperture Optics System for Remote Sensing Applications	$277,551
26581	Molecular-Scale Studies of Single-Channel Membrane Pores	$294,190
26582	Efficient Massively Parallel Techniques for Protein Structure Generation	$133,210
26583	Mapping Membrane Protein Interactions in Cell Signaling Systems	$363,619
27328	A Revolution in Lighting: Building the Science and Technology Base for Ultra-Efficient Solid State Lighting	$3,434,971
28769	Z-Pinch Power Plant System Development	$142,856
28770	Recyclable Transmission Line Concept for Z-Pinch IFE	$136,782
28771	Suppression of Electron Emission from Conductors	$148,630
28772	Solid State Switch for Advanced Pulsed Power	$208,781

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SNL - Sandia National Lab

Project ID	Project Name	Total
28775	Laboratory-Scale Coherent Multi-Kilovolt X-Ray Sources for Advanced Imaging Applications	$504,624
28776	Interfacial Bioscience Grand Challenge (IBIG)	$4,087,864
32574	High-throughput Instruments, Methods, and Informatics for Systems Biology	$428,738
32807	Low Work Function Material Development for the Microminiature Thermionic Converter	$295,708
32809	Autonomous Micro-Explosive Subsurface Tracing System	$305,673
32816	Vulnerability Assessment of National Power Grid	$310,713
32817	Molecular Simulations of MEMS and Membrane Coatings (PECASE)	$58,275
32913	Aging Mechanisms in Dormant MEMS Structures	$343,814
32914	Biomimetic Chloroplasts: An Integrated Microdevice Power Source	$201,637
32915	Study of Polymer Spin-Coating for Photolithographic Semiconductors in Near Zero Gravity Environment	$26,182
32923	MEMS in µFluid Channels	$311,806
33602	Dispersive Photonics for Next-Generation Sensors and Microsystems	$468,174
34465	Understanding Metal Vaporization from Transient High Fluence Laser Irradiation	$82,878
34466	Mechanics and Tribology of MEMS Materials	$265,277
34467	Dynamics of Metal/Ceramic Interfaces	$162,823
34468	In Situ Characterization of Soft Solution Processes for Nanoscale Growth	$96,881
34469	Determination of Critical Length Scales for Corrosion Processes using Microelectroanalytical Techniques	$162,577
34478	LIGA Microsystems Aging: Evaluation and Mitigation	$358,753
34485	Science Based Processing of Field Structured Composites	$88,360
34692	Self-Assembly of Polymers in Confined Geometries	$28,494
34693	Building Conscious Machines Based Upon the Architecture of Visual Cortex in the Primate Brain	$24,407
34698	Microfuze	$554,085
34699	Exploration of New Multivariate Spectral Calibration Algorithms	$145,763
35376	Development of Experimental Verification Techniques for Non-linear Deformation and Fracture	$50,000
36902	Mathematical Analysis of Deception	$40,852
36904	A System Dynamics Approach to Modeling Water Demand	$40,000

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SNL - Sandia National Lab

Project ID	Project Name	Total
38605	Microfabrication with Femtosecond Laser Processing	$315,160
38606	Meso-scale Controlled Motion for a Microfluidic Drop Ejector	$357,425
38608	Science-Based Sensing of Phase Transformations In Steels	$130,187
38609	Physical and Electronic Changes caused by Membrane Signaling as a Transduction Pathway in Affinity Based Biosensors	$292,352
38610	Graduated Embodiment for Sophisticated Agent Evolution and Optimization	$309,571
38611	Stochastic Programming for Enterprise Modeling -- Optimization for Nondeterministic Simulation	$240,701
38612	Robust Message Routing for Mobile (Wireless) Ad Hoc Networks	$298,703
38613	Scalable Fault Tolerant Algorithms for Linear-Scaling Coupled-Cluster Electronic Structure Methods	$227,257
38614	Micromagnetic Suspension	$155,270
38615	Sensitivities for Large-scale Simulation Codes	$218,255
38616	Engineered Superconductivity in Electron-hole Bilayers	$267,315
38617	Silicon-based RF MEMS Components	$443,557
38618	Arrayed Resonant Subwavelength Gratings	$354,621
38619	Nano-electromechanical Oscillators (NEMOs) for RF Filtering	$293,013
38620	Continous Wave Intersubband Terahertz Sources	$454,025
38621	Microsystems for Chemical Signature and Reagent Delivery	$301,349
38622	Microfluidic Cellular Sample Pretreatment	$514,063
38623	Automated Visual Direction of Mobile Manipulation	$323,731
38624	Miniature Fourier Transform Ion Mobility Spectrometer for Real Time Detection and Identification of Explosives and Chemical Agents	$194,775
38625	CONOPS Development for Automated Systems	$334,294
38626	Rapid Mitigation and Decontamination of Toxic Industrial Chemicals	$246,368
38627	EM Interactions with Systems to Enhance Security	$122,245
38628	Adaptive Awareness for Personal and Small Group Decision Making	$346,532
38629	Use of Seismic and Acoustic Responses to Assess Bomb Damage to Underground Facilities	$179,704
38655	Free-Space Electro-Optic Sampling and Remote Mapping of Electromagnetic Fields from Emitting Structures Using Femtosecond Terahertz Transceivers	$255,946
38659	Information Assurance for Wireless Ad Hoc Networks	$318,822

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SNL - Sandia National Lab

Project ID	Project Name	Total
38661	Low Toxicity Hypergolic Propellant System using H202 Oxidizer	$11,826
38662	Natural Gas Production Problems: Solutions, Methodologies, and Modeling	$307,893
38664	High Efficiency Turbine Blade Coatings	$150,683
38665	Time Domain Reflectometry for Remote, Real-Time Water Quantity/Quality Monitoring of Perennial and Ephemeral Streams	$241,334
38667	Research and Development of Mathematical Algorithms to Define and Quantify Critical Infrastructure Interdependencies	$163,773
38668	Functionalized Nanoelectrode Arrays for In-situ Identification and Quanitification of Regulated Chemicals in Water	$351,464
38669	Hybrid Infrastructure Cryptography	$289,851
38672	Validated Modeling of Distributed Energy Resources at Distribution Voltages	$95,228
38673	Water Desalination	$308,746
38674	Revolutionary Systems for Catalytic Combustion and Diesel Catalytic Particulate Traps	$409,257
38677	Potential Application of Microsensor Technology in Radioactive Waste Management - With Emphasis on Headspace Gas Detection	$239,971
38678	Surety Enhancement for Wireless Automated Control Networks	$238,113
38679	Advanced Nuclear Engineering Analysis Technology	$243,065
38681	Identification of Chemical Plumes: Range-Resolved IR Lidar Enabled by New Photonic Technologies	$455,117
38682	Multiscale Thermal Modeling	$300,818
38684	A Robust, Coupled Approach for Atomistic-Continuum Simulation	$282,040
38685	Microscale Rarefied Gas Dynamics and Surface Interactions for EUVL and MEMS Applications	$352,210
38686	High Fidelity Frictional Models for MEMs	$408,897
38687	Soot Formation, Transport, and Radiation in Unsteady Diffusion Flames	$304,189
38688	The Basics of Aqueous Nanofluidics: "Interphase" Structure and Surface Forces	$293,501
38689	Design, Synthesis, and Characterization of Soft Matter Nanolayer Superlattices	$297,719
38690	Photo-control of Nano-interactions in Microsystems	$278,883
38691	Electrochemically Deposited Alloys With Tailored Nanostructures for LIGA Micromachines	$339,613
38692	Nanostructured Materials for Directed Transport of Excitation Energy	$294,046

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SNL - Sandia National Lab

Project ID	Project Name	Total
38693	Modeling Local Chemistry in the Presence of Collective Phenomena	$168,207
38695	Passive-legged, Multi-Segmented, Robotic Vehicle	$232,066
38696	Low Cost Photonic Lattice Structures for Remote Sensing	$329,746
38698	Security Monitoring and Management with Information Technology (SUMMIT)	$196,100
38699	Novel Methods for Ultra-Compact, Ultra-low-power Communications	$247,852
38701	Novel Tagging Technologies for the Tracking and Authentication of Documents, Property, and Other Items	$180,223
38702	A Revolutionary Long-lived Power-supply: The Icosahedral Boride Semiconductor (IBS) Beta-Cell	$486,832
38703	Remote Sensing Data Exploitation for Geologic Characterization of Difficult Targets	$355,128
38705	The Effects of Varying Humidity on Copper Sulfide Film Formation.	$195,890
38706	Detecting and Tracking the Active Insider Using 3D Detection Technology	$191,654
38707	Microfabricated Dielectrophoretic Sample Preparation System	$289,800
38708	Automation of Microelectronic Physical Analysis	$236,413
38712	Nonlinear Optical Limiters Using Photonic Bandgap Structures For Sensor Protection	$299,349
38713	Secure MPLS Control Plane for Internet Connectivity	$226,000
38717	Nano-Scale Energetic Materials By Inverse Micellar Synthesis	$295,013
38718	Modeling of Rock Penetration	$190,998
38722	Agile, Microsystems-Enabled Receiver	$583,347
38744	Adaptive Network Countermeasures	$184,397
39017	Solution-Based Nanoengineering of Materials	$318,816
39212	MEMS-Based Electromechanical Acoustic Energy Harvester	$25,000
39669	Determination of Microstructural Properties With Isentropic Compression	$187,730
39670	Simulations of Intense Petawatt Laser Pulses with Dense Z-Pinch Plasmas	$250,684
41193	Bio MicroFuelCell	$1,929,068
41194	Augmented Cognition: Next-Generation Intelligent Systems	$1,815,334
41427	Predicting and Validating MEMS Interface Reliability	$354,880
41674	MicroEngine for Advanced Power Generation	$379,507
41726	Direct Simulation of Solid-Fluid Systems	$40,000

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SNL - Sandia National Lab

Project ID	Project Name	Total
42461	Support-Active Site Interactions in Heterogeneous Catalysts	$99,885
42483	An Analysis of the Automotive Industry as a Source for Weapon Components and Manufacturing Processes	$242,882
44136	Fluid-Structural Interactions in Wetting and Penetration into Porous Media	$74,792
45279	Macroscopic Rates, Microcopic Observations, and Molecular Models of the Dissolution of Carbonate Phases	$72,066
46070	High Speed Micro-EDM	$40,000
46685	Nanoscale Hotspots Due to Nonequilibrium Thermal Transport	$40,000
46686	Micro External Combustion Engine: The P3 Engine Prototype	$20,330
47517	Mathematical and Algorithmic Issues in Multiphysics Couplings	$24,962
47795	Lipid Membranes on Nanostructured Silicon	$31,743
48746	Digital Signal Processing for Acoustic-Seismic Target Identification	$194,971
49769	Resin Infusion between Double Flexible Tooling	$22,530
49770	Frameworks for Nuclear Process Transparency and Control	$99,253
49772	Studies on the Disbonding Initiation of Interfacial Cracks	$40,000
49915	Critical Technology Development for Hard Target Defeat High-G Tolerant Fuze and High Explosives	$1,702,709
50065	TALON	$3,992,318
50396	Compliant Membranes for MEMS Microphones	$25,000
50717	Multi Scale Experimental/Numerical Study	$50,000
50772	Cellular Observatory: Simultaneous Time- and Frequency-Resolved Microscopy	$233,739
52174	In-elastic Deformation Mechanism in Shocked Sapphire Single Crystals	$20,000
52523	Atomic Layer Deposition of Highly Conformal Tribological Coatings	$364,809
52524	Assembly of Microsystems using Exothermic Multilayer Thin Films	$307,056
52526	Intelligent Interaction Control as Applied to Metrology and Assembly of Micro-Scale Components	$347,736
52527	Rapid Prototyping High-Density Circuitry (RpHdc)	$344,954
52528	Elucidating the Mysteries of Wetting	$378,632
52530	Next Generation Spindles for Micromilling	$108,304
52531	Assembly and Actuation of Nanomaterials Using Active Biomolecules	$482,191
52532	Modeling Biomembranes	$346,883

SNL - Sandia National Lab

Project ID	Project Name	Total
52533	Reverse Engineering Biological Networks: Applications in Immune Responses to Bio-Terrorism Threats	$339,821
52536	High Throughput Identification of Molecular Machines Involved in Membrane Signaling and Toxin Pathways	$286,594
52537	Coupled Solid-fluid-mechanical Computational Modeling of Fracture and Fragmentation in Geomaterials, Such as Hard and Deeply Buried Targets (HDBT)	$341,687
52538	Sequestration of Pathogens on Nanoengineered Surfaces	$504,858
52539	A Combined Preconcentrator and Sensor for Live Water-borne Pathogens	$203,311
52540	IP Storage: A Performance and Security Study	$206,740
52541	A Parallel Circuit Simulator for Cell Biology	$211,573
52542	Developing a Computationally Efficient Dynamic Multilevel Hybrid Optimization Scheme using Multifidelity Model Interactions	$269,863
52543	Robust Large-Scale Parallel Nonlinear Solvers for Simulations	$198,248
52544	Development of Computational Algorithms and Inversion Capabilities for Transport/reaction Simulations of Chemical/biological/radiological Terrorist Attack Scenarios in Support of Homeland Security	$439,800
52546	Massively-Parallel Linear Programming	$149,027
52548	Active Photonic-Crystal Devices for Integrated Photonics and Silicon photonics	$453,267
52549	Co-processing of Chalcogenide-Based Radiation-Hard Nonvolatile Memories by Sandia's MDL and BAE Systems.	$316,170
52551	Functionalized Nanoparticles for Sensor Applications	$422,992
52552	Novel In Situ Mechanical Testers to Enable Integrated Metal Surface Micro-machines	$368,724
52553	Compliant Thermo-Mechanical MEMS Actuators	$340,746
52554	An Integrated, Stacked System-on-a-chip	$195,190
52555	Micro Mass Spectrometer on a Chip	$350,909
52556	Quantum Coherence in Semiconductor Nanostructures for Improved Lasers and Detectors	$350,609
52557	MOSFET-MEMS Integration	$342,209
52566	Micro Optical Gyroscope Via Monolithic Active/Passive Optical Integration	$375,972
52570	Materials Physics and Device Development for Improved Efficiency of GaN HEMT High Power Amplifiers	$473,886
52571	Leaky-mode VCSELs for Photonic Logic Circuits	$444,632

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SNL - Sandia National Lab

Project ID	Project Name	Total
52575	Advanced Polychromator Systems for Remote Chemical Sensing	$347,277
52577	Immunological Basis for High Reliability Systems Control	$245,891
52579	Miniaturization of SAR Electronic Assembly Using Sandia's Integrated Substrate Technology	$101,369
52580	Moving Target Identification Using Ultra High Range Resolution Data	$98,850
52581	Advanced Mobile Networking, Sensing, and Controls using Graph Theory	$341,271
52582	Compact TeraHertz (THz) Sources for ET applications	$332,576
52583	Understanding Communication in Counterterrorism Crisis Management	$319,784
52584	Hyper-Velocity Impact Generated Flash	$99,226
52585	Improving Human/System Interactions in Systems-of-Systems	$269,449
52586	Distributed Detection & ID Algorithm Architecture for Unattended Ground Sensors	$159,543
52587	Secure Chaotic Communications	$89,807
52588	System of Systems Modeling and Analysis	$346,142
52589	Eye Safe Short Range Standoff Aerosol Cloud Finder	$153,099
52590	Micro Flame-Based Detector Suite for Universal Gas Sensing	$250,057
52591	Beyond Nanoparticles - Attack on a Chemical "Holy Grail"	$250,638
52592	Advanced Proton-Exchange Materials for Energy Efficient Fuel Cells	$397,996
52593	Alanate-Hydride Fuel Cell Demonstration Project	$305,705
52594	Vapor-liquid Phase Behavior of the Iodine-sulfur Water Splitting Process	$235,009
52595	Real-time Discriminatory Sensors for Water Contamination Events	$312,062
52596	Advanced High Efficiency Direct Cycle Gas Power Conversion Systems for Small Special Purpose Nuclear Power Reactors	$339,851
52597	Securing Mobile Code	$288,550
52598	Novel Catalysts For Hydrogen Fuel Cell Applications	$300,650
52606	Linking Optimization and Simulation in Critical Infrastructure Systems	$345,560
52608	The Mechanism of Permeable Reactive Barrier Formation and Field Test of an Packed Bed for Arsenic Removal from Water	$259,873
52609	Analysis of Nano-scale Films and Particles	$70,553
52611	Radiation-Transport Method to Simulate Noncontinuum Gas Flows for MEMS Devices	$112,380
52613	Tensegrity - smart, Adaptive Structures Through Material Biomimicry	$67,890

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SNL - Sandia National Lab

Project ID	Project Name	Total
52615	Coupled Acoustical/structural Simulations of Weapons Systems	$100,292
52698	Decomposition of Contaminants Using Photochemically Active Nanoparticles	$423,235
52699	Thermally Cleavable Surfactants	$296,412
52700	Transition-metal Catalyzation of Complex-hydride Absorption/desorption Reactions	$198,520
52701	Quantification of Environments and Surfaces within Micro-Packages	$391,813
52702	Assembly of Ordered Electro-Optical and Bioactive Materials and Composites	$413,067
52703	Advanced Packaging / Joining Technology for Microsystems	$326,891
52705	Magnetostrictive Elastomers for Actuators and Sensors	$152,736
52706	Development of a High-Throughput Microfluidic Integrated Microarray for the Detection of Chimeric Bioweapons.	$166,548
52707	Active Network and Use of Network Processor	$252,694
52708	Zero-Power Radio Receiver	$252,227
52709	Completely Passive Microwave Tag	$250,391
52710	Security Coatings for Multichip Modules	$287,684
52711	Detailed Modeling and Simulation of Contaminant Transport in Architectural Spaces	$341,666
52712	Content-Based Video and Image Indexing System	$198,725
52713	Bioaerosol Collection & Concentration for Microseparations-based Detectors	$556,112
52714	Detecting The Toolmarks Of Genetic Engineering In Bioweapons Strains	$282,329
52716	Joint Authentication/Encryption	$192,131
52717	Ultra High Temperature Ceramics for Hypersonic Vehicle Applications	$242,828
52718	Leveraging Robotic Planning for Physical Security Analysis	$249,266
52719	Buzzard	$56,773
52720	Ultra-Lightweight Telescope with MEMS Adaptive Optic for Distortion Correction	$430,859
52721	Modeling Signals from Earth Penetrating Nuclear Weapons for Remote Kill Assessment	$279,239
52722	Radiation Hardened Optoelectronic Components for Space-based Applications	$200,538
52723	Novel Micro-Preconcentrators For CW, Explosives And Water Surety	$254,363
52724	Ion Mobility Spectrometer-Mass Spectrometer	$268,716
52725	Cryptographic Assurance of Execution Correctness and Confidentiality	$363,037

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SNL - Sandia National Lab

Project ID	Project Name	Total
52726	Characterization, Performance and Optimization of PVDF as a Piezo-electric Film for Advanced Space Mirror Concepts	$299,688
52727	Predictive Accelerated Aging of Microsystems: The Science of Dormancy	$731,850
52728	Surety and Accountability Enhancements for Storage Containers	$297,834
52729	Nuclear Safety Weaklinks for Thermal and Mechanical Environments	$401,293
52730	Advanced Packaging Technology for Optical Firesets	$312,729
52731	Miniature Transmitter Filter for JTA Using LIGA Technology	$312,316
52732	Novel and Robust Environmental Sensing Devices (ESDs)	$430,947
52733	Advanced Neutron Monitors for JTA and Stockpile Monitoring	$325,921
52737	Development of an Efficienct Large-Aperture High Damage-Threshold Sol-gel Diffraction Grating	$141,917
52738	Laser Triggering of Water Switches in Terrawatt class Pulse Power Accelerators	$100,757
52739	Experimental and Computational Study of Liquid-Liquid and Freezing Phase Transitions	$96,360
52740	A MicroBioReactor for Hydrogen Production	$102,479
52741	Self Organizing Software Research and Development	$295,684
52742	Highly Specific Electronic Signal Transduction Mediated by DNA/Metal Self-Assembly	$101,777
52743	Computational Model of a Microbial Cell	$95,335
52744	Biomimetic Air Sampling for Detection of Low Concentrations of Molecules and Bioagents.	$99,591
52745	A Biological Model for Controlling Interface Growth and Morphology	$113,799
52746	Nanostructured Polyoxometalate Arrays with Unprecedented Properties and Functions	$102,086
52747	Ornithopter	$40,208
52748	Light-powered Nano-vehicles	$100,297
52749	Anomalously High Photocurrents in Nanostructured Electrodes: a new local microchip power source	$86,420
52750	Quantum Computing Accelerator I/O	$130,106
52797	Design and Control of the Magnetic Properties of Nanoparticles	$50,000
52825	Aerospace Vehicle Trajectory Optimization System by Primer Vector Methods	$25,000
52826	Algorithm Development for Smart Antennas	$13,000

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SNL - Sandia National Lab

Project ID	Project Name	Total
52976	Failure Analysis and Surety Design of Composite Patching Systems	$13,300
52977	Flow Control and Mixing in Microfluidic Devices	$20,000
53342	Investigations into the Transient Analysis of System Reliability/Availability via Cumulant Functions	$0
53372	Topological Layout for the Optimal Design of Electrostatically Actuated MEMS	$20,000
53464	Atomic-scale Scanning Tunneling Microscopy Measurements of Nucleation and Growth of Ge/Si Alloy Structures	$40,517
53465	Micro/Nanoscale Thermomechanical Manufacturing	$20,000
53585	Novel Diagnostics for Rarefied Flows in MEMs Applications	$214,242
53586	Geophysical Subsurface Imaging and Interface Identification	$241,774
53587	Evolution of Near Surface Scalar Concentrations Through a Compact Cylinder Array Embedded in the Atmospheric Surface Layer	$30,402
53588	Miniature High-Power RF Components Enabled by Meso-scale Manufacturing	$263,055
53589	Electron and Proton Beam Directed Energy Defense Weapons	$205,287
53590	Electrical Conductivity of Metal Alloys	$203,206
53591	Hydrogen Futures Dynamic Simulation Model	$254,494
53681	Design of Bio Specific Surfaces to Control Specific Cellular Responses	$20,000
53682	High-field Effects of GaN HEMTs	$20,000
54210	Cognitive Models Applied to Human Effectiveness in National Security Environments	$13,300
54211	Nanomagnetic Films	$20,000
54213	A Multi-scale Approach to Modeling Carbon Nanotube Reinforced Composites	$20,000
55079	Near Real Time Characterization for Assured HDBT Defeat	$1,163,826
55086	Prompt Global Response	$891,868
55087	Winning the War: A Systems Approach to Defending Our Borders	$1,710,439
57300	Integrated Superhard and Metallic Coatings for MEMS	$47,937
57307	Microscale Separations of Biological Compounds Using Novel Polymeric Separations Materials	$49,881
57308	Friction in Micromachine Interfaces	$47,595
57309	Lipid Microarray Biosensor for Biotoxin Detection	$40,000
57310	Advanced Manufacturing Techniques Using Rapid Prototyping	$39,325
57311	Robust Hermetic Packaging Techniques for MEMS Integrated Microsystems	$40,236

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SNL - Sandia National Lab

Project ID	Project Name	Total
58336	Surfactant Effects On Lateral Growth And Surface Morphology of GaAs	$10,000
58907	Active Photonic Nanostructures	$516,598
59034	3-D Large Eddy Simulation of Turbulent Flow based on One-Dimensional Turbulence Modeling	$94,572
59916	A Method of Evaluating Research Using New Innovation, Risk, and Impact Indicators	$98,759
60626	The Derivation and Implications of 'Nearly Non-informative' Priors from Metadata-conditioning	$57,847
60627	New Seismic Event Detection Technology	$74,862
60628	Dynamic Simulation Modeling and Analysis Support for Senate Energy and Natural Resources Committee	$79,399
60866	SDAC Architectural Study and Demonstration System Development	$190,540
61045	Testing Recent Metal/Oxide Joining Discoveries in NW Component Manufacturing	$118,441
61046	Photonic Encryption using All-Optical Logic	$103,426
61047	Automated Video Screening for Unattended Background Monitoring in Dynamic Environments	$99,064
62269	Nanoporous-Carbon Adsorbers for Chemical Microsensors	$120,935
62270	Assessment of Information Flow Associated with Goods and People Crossing International Borders	$79,796
62826	Automatic Detection of Anomalous Weapon Surveillance Waveforms	$58,925
62827	Non-Lethal Technologies for the War on Terrorism	$652,368
62970	Computational Social Dynamic Modeling of Groups Perpetrating Violence	$173,583
62971	Development of a Terrorist Activity Plan Assessment Methodology	$189,363
62972	Development of an Interactive Nuclear/WMD Terrorist Data Model	$70,586
63965	Hyperspectral Tagging for Unique Identification	$39,837
63966	Smart Decoy Sensor Network	$49,850
63967	Fusing MSI and HSI Imagery for Subpixel Spectral Unmixing	$70,067
63968	Monomolecular Carbon Nano-Thread Fabrication	$50,073
63969	Reliability Data to Improve High Magnetic Field Coil Design for High-Velocity Coilguns	$57,969
63970	Sandia Dual-Use Formulation for CBW/Fire Suppression Capabilities	$52,456
63971	Enabling Technology for Human Collaboration	$193,988

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SNL - Sandia National Lab

Project ID	Project Name	Total
63972	Molecular Electronics Test Platform	$98,123
64214	Study of 3-D Focal Region Sounding Applied to Large Aperture Telescopes	$24,293
64215	Affordable, Automated Computed Tomography (CT) X-ray Screening for Large Vehicle Bombs Preliminary Study	$61,350
64355	Coordinated Weapon-Platform Control Strategies for Intelligent Targeting	$75,124
64356	Advanced Weapons Signatures	$65,082
64385	Universal Detection for Chem-Bio Sensing in Microfluidic Systems	$66,342
64386	Large-Scale System Dynamics Modeling of Water Resources on the Rio Grande	$24,247
64709	Development of Highly Integrated Magnetically and Electrostatically Actuated Micropumps	$25,992
64711	Wide-Area Surveillance in Synthetic Aperture Radar Images	$47,819
64811	Agent-Based Control of Distributed Infrastructure Resources	$126,868
65148	Multipurpose Locator-Tag System	$39,769
65556	A Robotic Framework for Semantic Concept Learning	$20,000
65557	Optical Trapping of Collisionally Cooled Molecules	$81,831
65558	Detection and Reconstruction of Error Control Codes for Engineered and Biological Regulatory Systems	$72,757
65559	Direct Single Ion Machining of Nanopores	$51,542
65828	Measures of Effectiveness and Performance for MicroTalon SDAC Technologies and Systems	$56,884
66159	Creative Networking of Commercial Products	$46,494
66160	Networked Device Demonstration	$41,771
66161	Analysis of Multichannel Internet Messaging	$41,868
66170	Investigation of the Effects of Intense Pulsed Particle Beams on the Durability of Metal-to-Plastic Interfaces	$37,143
66233	Efficacy of the Sandia Decon Formulation on the SARS Coronavirus	$99,529
66450	Advanced Techniques for Multi-Objective Discrete Optimization	$20,000
66610	Fundamentals of Mobile Robot Development	$50,000
66809	Non-radioactive Safety & Performance Issues with Supercritical Water Reactor Safety (SCWR) Technologies	$25,000
66810	Radiation Performance Issues with Advanced Coolants for Next Generation Reactor	$25,000

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SNL - Sandia National Lab

Project ID	Project Name	Total
67542	Harnessing Methane Hydrate-Bacteria Interactions for Energy Source and Storage Application	$39,965
67716	Smart Detectors of Enrichment of Bio-Aerosols	$20,000
68063	Computational Studies of JP-8 Diffusion Flames with Detailed Chemistry and Particulate Formation	$20,000
68552	Investigation of Bioprocesses for Advanced Manufacturing Applications	$0

Total # of Projects for SNL: 366 **Total Cost for SNL: $97,818,916**

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SRP - Savannah River Plant

Project ID	Project Name	Total
SR01005	Atomic Oxygen for Decontamination of Tritium from Surfaces	$65,999
SR01008	Tritium Exchange Material for Tritium Stripping from Glovebox Atmosphere	$110,788
SR01014	Surface Plasmon Resonance Spectroscopy-Based Process Sensors	$77,997
SR01016	Miniature Mass Spectrometer for Gas Analysis	$10,204
SR01017	Fiber Optic Raman Spectroscopy Sensor	$65,148
SR01023	New Sol Gel Tritium Scintillation Detector	$53,932
SR02015	Alanates as a New High Capacity H2/T2 Storage Material	$184,805
SR02016	Catalyzed Metallic Glass for H2 Separation	$67,178
SR02023	Hydrogen Isotope Permeation Testing	$171,285
SR02031	Large-scale Fabrication Process for Hydride/Sol-Gel Composites	$189,285
SR02033	Laser Cladding for Tritium Permeation Barrier Coatings	$139,158
SR02042	Thermal Absorption Diffusion Isotope Separation Process	$240,962
SR03000	Management Reserve	$10,345
SR03001	Plasma Arc Process to Decontaminate Palladium for Recycle	$13,711
SR03002	Discover New Hydride Metal-alloys Using the "Materials as Systems" & "Combinatorial Library Synthesis" Methodologies	$87,169
SR03004	Modeling of Pressure Swing Adsorption Processes For Hydrogen Separations	$37,932
SR03005	Fill Stem Decontamination Using Plasma and/or Atomic Oxygen	$65,857
SR03006	Heat Transfer and Modeling of Next Generation Metal Hydride Beds	$88,355
SR03008	Catalyzed Alkali Metal Borohydrides for Tritium and Hydrogen Storage	$108,309
SR03014	Glass Microsphere Encapsulation of Hydrogen Absorbents	$44,601
SR03029	Evaluation of Alternate Stainless Steel Surface Coatings and Methods for Passivation	$32,471
SR03030	Evaluation of Non-Reactive, Permeation Resistant Materials for Tritium/Hydrogen Storage & Processing	$74,333
SR03036	Tritium Reservoir Performance Prediction and Analysis Tools	$90,883
SR03037	Pinch Weld Process Improvement Using Secondary Variable Analysis and Advanced Weld Controls	$138,490
SR03038	Development of a Stainless Steel Alloys with an Innate/Self-Healing Permeation Barrier	$80,675
SR03046	Multiplexed Vapochromic Ammonia and Moisture Sensors for Tritium Process Monitoring	$71,836

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SRP - Savannah River Plant

Project ID	Project Name	Total
SR03052	Universal Tritium Transmitters	$47,819
SR03053	Ion Chamber for Tritium Monitoring to Minimize High Backgrounds Due to Surface Area Contamination	$46,861
SR03054	Tritium Reservoir Surface Defect NDE Inspection Feasibility Study	$68,992
SR03060	Palladium on Ceramic as an Alternative to Palladium on Kieselguhr	$23,895

Total # of Projects for SRP: 30 **Total Cost for SRP: $2,509,275**

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Project List -- Fiscal Year 2003

Y_12 - Y-12 Plant

Project ID	Project Name	Total
Y1201006	Net Shape Forming (NSF)	$58,765
Y1201013	Microwave Heating Technology for Uranium Annealing	$73,206
Y1201020	Rapid in-situ identification of fissile material type in cans	$58,774
Y1201021	Direct Electrolytic Reduction of U Oxides (DERO)	$191,628
Y1201024	A New Approach to Bright, High-Resolution X-Ray and Electron Screens for Digital Imaging	$61,263
Y1201029	Real-Time Beryllium Oxide (BeO) Air Monitoring	$261,300
Y1201030	High Energy Beam cutting Processes for disasembly	$48,105
Y1201033	Enhanced Absorption of Microwave Energy by Near-Molten Metals	$140,277
Y1201039	Development of Real-Time Monitor For Measuring Beryllium In Air	$198,474
Y1201043	High-density, non-contact inspection of workpieces	$154,757
Y1201044	Binary by SDOR	$59,714
Y1201049	Non-Contact Ultrasonic Inspection	$27,494
Y1201053	Advanced Technology Assessment Team	$90,208
Y1202005	Hand-Held Enrichment Meter	$138,407
Y1202006	Silicone Rubber Scintillator with High Boron Content	$71,945
Y1202007	Alternative Fluorinating Agents to Produce UF4	$63,180
Y1202009	Real Time Identification of Airborne Particles	$71,776
Y1202012	Novel Vision System for Production Welding	$42,155
Y1202014	Advanced Melting Process using Infrared Technology	$532,911
Y1202015	Infrared Preheating of Uranium Billets	$195,092
Y1202031	Denaturing	$69,924
Y1202036	Waste Minimization of Uranium Solutions Using Chromatographic Separations	$68,797
Y1202039	Equal-Channel Angular Processing (ECAP) to Develop Fine-Grained, Homogeneous Microstructures	$121,898
Y1202040	Microstructure Control through Orientation Imaging Microscopy	$130,881
Y1202044	Alternate Route to UF4 Manufacture	$67,967
Y1202051	Separation of Uranium from Slag	$15,348
Y1202052	Advanced Dynamic Data Analysis Capability	$67,428
Y1202053	High Resolution Imaging System	$232,402
Y1202095	Metal Preparation Modeling	$93,904

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Project List -- Fiscal Year 2003

Y_12 - Y-12 Plant

Project ID	Project Name	Total
Y1202096	Zone Refining	$161,637
Y1202097	Alternate Uranium Casting	$323,098
Y1202098	Inverse Uncertainty Analysis	$99,489
Y1202099	Predictive Performance Indicators for the Continuous Automated Vault Inventory System (CAVIS™)	$170,148
Y1202100	Error Budget Analysis of Slant Bed Lathe	$129,277
Y1202101	Devices for automation of Frequency Response Function Measurement for High-speed Machining	$92,080
Y1202102	FU Radiation Detectors based on I-III-VI2 Crystals	$32,664
Y1202103	TSU Fuzzy Logic Analysis of Measurement Uncertainty	$87,186
Y1202105	UNCC Hole-plate artifact assessment	$2,794
Y1202106	UFL High Speed Machining Surface Location	$3,450
Y1202107	NCSU Design and Fabrication of Measurement Artifacts Principal	$6,699
Y1203001	Radiograph archival	$11,010
Y1203006	Enhanced Chip Casting	$35,853
Y1203010	U-C Phase Diagram	$167,532
Y1203014	High-accuracy, high data density measurement uncertainty	$3,504
Y1203016	Salt Certification Substitution	$101,231
Y1203020	Optic Flaw Detector	$31,756
Y1203021	Micro CT	$22,803
Y1203023	SFM Process Monitoring	$16,228
Y1203032	High Speed Machining	$170,209
Y1203039	Advanced SDOR	$74,293
Y1203043	ID of Ultra-fine Particles	$29,528
Y1203050	Lugless Casting	$28,715
Y1203051	Multi-Zone Furnace	$10,318
Y1203059	Magnetic Filtration of Particulate Containing Uranium	$89,235
Y1203065	Enhanced Active Seal System	$121,041
Y1203073	LiH Assessment	$3,091
Y1203074	IWMS	$643,082

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Project List -- Fiscal Year 2003

Y_12 - Y-12 Plant

Project ID	Project Name	Total
Y1203075	Project2	$2,950
Y1203076	Tech Infusion	$23,657

Total # of Projects for Y_12: **59** **Total Cost for Y_12:** **$6,102,538**

The Secretary of Energy
Washington, DC 20585

January 28, 2004

Secretarial Affirmation

The Conference Report accompanying the Energy and Water Development Appropriations Act for Fiscal Year 2002 (H.R. 4733) directs the Secretary of Energy to include in the annual report to Congress for all Laboratory Directed Research and Development (LDRD) activities an affirmation that all LDRD activities derived from funds of other Federal agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the appropriations acts that provided funds to those agencies. In response, the Department initiated revised procedures for LDRD program charges on other Federal agency funded Work for Others projects for fiscal years 2002 and beyond. These procedures changed the Work for Others process to ensure proper notification of other Federal agencies as to the LDRD charges prior to funding work at the laboratory. Specifically, each new and/or revised Work for Others proposal provided to a Federal agency must indicate the amount of LDRD charges that will be collected. Furthermore, the proposal notifies the sponsor that, by providing funding, the agency is acknowledging LDRD activities are beneficial to their organization and consistent with appropriation acts providing funds to that agency. Subsequently, each Work for Others funding acceptance document also includes the LDRD estimate acknowledgement. In addition, the Department of Energy Field Chief Financial Officers ensure all policies and procedures are complied with at each LDRD site by means of an annual certification. This document provides my annual affirmation based on the procedures described above.

Spencer Abraham

Appendix 2

LDRD Legal Authority and Order

The LDRD program operates under the same statutory and Departmental guidance that it has in past years, and the laboratories work closely with DOE personnel to assure the careful Federal oversight that both the letter and spirit of the guidance intends.

Authorization Basis

The Atomic Energy Act (AEA) of 1954, as amended, 42 U.S.C. 2011 et seq., Section 31, directs DOE to exercise its powers to ensure the continued conduct of R&D and training activities and to assist in the acquisition of an ever-expanding body of theoretical and practical knowledge in the fields of energy, its production, uses, handling, and effects. This mission was initially the responsibility of the Atomic Energy Commission (AEC), then the Energy Research and Development Administration, (ERDA) and subsequently that of DOE.

The current LDRD program is consistent with the mission of providing a program of conducting, assisting, and fostering research and development to encourage maximum scientific and industrial progress, contemplated in Section 3 of the AEA and confirmed in subsequent laws applicable to the successor agencies, ERDA and DOE. Public Law 95-39 (Section 303), dated June 3, 1977, authorized any laboratory under contract with ERDA, with the Administrator's approval, to "use a reasonable amount of its operating budget for the funding of employee-suggested research projects."

Section 3132(d) of the National Defense Authorization Act for FY 1991 (Public Law 101-510), set the funding limit for each Laboratory's program at 6 percent of the Laboratory's total operating and capital equipment budget. In FY 2000, Section 308 of the Energy and Water Development Appropriations Act (H.R. 2605) reduced the funding level to 4 percent with the additional restriction that none of the funds in the Environmental Management programs are available for Laboratory Directed Research and Development. This reduction had a notably deleterious effect on the LDRD program and the DOE National Nuclear Security Administration (NNSA) Laboratories. The Energy and Water Development Appropriations Act for FY 2001 (Section 306) restored the funding to 6 percent, and the explanatory language of the accompanying Conference Report (106-988) directed the Department's Chief Financial Officer "to develop and execute a financial accounting report of LDRD expenditures by laboratory and weapons production plant." The 6 percent funding level remained in effect in FY 2003.

DOE Orders Governing the LDRD Program

With this authorization basis, the LDRD program, since its inception in FY 1991, has been under continual oversight by DOE to ensure compliance with Congressional requirements. During 1991, the Department developed and implemented DOE Order 5000.4, *Laboratory Directed Research and Development,* establishing formal processes to manage and oversee the LDRD program. These processes have been subject to ongoing Departmental review and revision to ensure compliance with Congressional intent and with Departmental policies and requirements. On April 9, 1992, the DOE Order was revised to increase the emphasis on Departmental oversight of research and development activities. In 1993, individual program organizations provided additional instructions through a set of "Responsibilities and Guidelines." In 1997, DOE updated the 1992 DOE LDRD Order to DOE Order 413.2, *Laboratory Directed Research and Development,* [1] and more recently to DOE Order 413.2A, *Laboratory Directed Research and Developmen,t* [2] to include the new NNSA.

The DOE Order 413.2A provides guidance in the following areas:

- General criteria for the selection of LDRD projects;
- Limitations on the duration of LDRD projects;
- Limitations on the total maximum annual funding for the LDRD program;
- Excluded activities under LDRD funding;
- Responsibilities of DOE offices (including field offices); and
- Contractor requirements, including annual planning and reporting documents.

[1] DOE Order 413.2, March 5, 1997.
[2] DOE Order 413.2A, op. cit., p. 1.

Appendix 3

DOE Program Management and Oversight

Overview

DOE's oversight of LDRD activities ensures that the objectives stated in DOE Order 413.2A, *Laboratory Directed Research and Development,* are accomplished by each laboratory's LDRD program. The objectives are to "maintain scientific and technical vitality of the laboratories; enhance the laboratories' ability to address future DOE missions; foster creativity and stimulate exploration of forefront science and technology; serve as a proving ground for new research; and support high-risk, potentially high-value research and development."

The oversight process is consistent with DOE's overall management approach and philosophy for all research and development activities, and includes annual planning and reporting documents and program and peer reviews. The Department followed a rigorous process in developing the LDRD policy and establishing the 6 percent maximum level. The 6 percent limit is a maximum and not an automatic provision. The Department approves a specific level of funding and a plan for each laboratory annually. In addition to the requirements and specific oversight mechanisms defined in DOE Order 413.2A, the Department conducts an annual evaluation of the full spectrum of science and technology at the laboratories as part of the overall appraisal of contractor performance. This evaluation spans all programmatic activities, and specifically includes LDRD, looking at its quality of science, strategic alignment, and relevance to DOE missions.

Much of the input to this retrospective evaluation comes from independent external peer review committees composed of scientific leaders from industry and academia as well as from the Federal research community including the laboratories themselves. The result of this science and technology evaluation is additional input for the Department in the assessment of the value and level of funding for LDRD activities. In addition, LDRD is an integral element of the laboratories strategic planning process and all research and development, including LDRD, conducted at the laboratories is reviewed at least annually through on-site reviews.

The Office of Science (SC), the Office of Nuclear Energy, Science and Technology (NE), and the NNSA have established a common oversight process to ensure the laboratories effectively manage their LDRD programs in accordance with DOE Order 413.2A. The process is designed to allow flexibility to the laboratory in implementing its LDRD program, while ensuring effective DOE oversight and stewardship of the taxpayers' dollars.

Planning

Each laboratory is required to submit an annual LDRD Program Plan for approval to the cognizant Secretarial Officer and Site Office Manager before the start of the fiscal year. The plan must include a requested funding level as well as a general description and justification of the LDRD program. It must describe how the LDRD program will contribute to and strengthen the laboratory's science and technology capabilities, support the laboratory's mission and benefit the Department and the Nation. In addition, each laboratory must establish and describe criteria for selecting and prioritizing projects. These criteria include utilizing internal peer and scientific management reviews that support and validate the innovative scientific and technological excellence of the program. The cognizant Site Office reviews the laboratory's proposed annual LDRD plan and funding level and provides its written recommendation to the cognizant Secretarial Officer.

As part of this recommendation, the Site Office Manager certifies that the laboratory's method for accumulating LDRD funds meets the requirements of DOE Order 413.2A. The Order requires Site Office Managers to annually review and certify to Headquarters that the laboratory's method for accumulating LDRD funds is consistent with the maximum allowable funding, and is in accordance with terms and conditions of the laboratory's contract. The Site Office LDRD managers, as well as the field financial managers, are involved in conducting these reviews in early summer of each year. Financial accountability, as demonstrated by these reviews, is a strong factor in the Site Office's recommendation to the Department of the LDRD funding level.

The cognizant Secretarial Officers annually approve each laboratory's LDRD plan and the maximum funding that may be expended on LDRD activities for the next fiscal year. This approval is based on the reasonableness of the documentation, the Site Office's recommendation, results from the prior year's review of the program, and the Laboratory's overall performance in managing its LDRD program. The approval also considers input from appropriate Departmental program managers. Throughout the fiscal year, the DOE works closely with each laboratory and reviews any proposed LDRD program modifications or adjustments to ensure that the laboratories realize optimum mission benefits. No individual LDRD project may begin without concurrence from DOE.

Implementation

DOE has established efficient management policies and processes to provide effective oversight of the LDRD program. The management processes ensure proper oversight of current research thrusts while maintaining flexibility to address future needs.

The laboratories implement the LDRD program in accordance with the requirements in DOE Order 413.2A. While the timing or details of discrete DOE oversight activities may differ somewhat from laboratory to laboratory, the oversight processes among all the DOE program offices have certain key elements in common. For example, all LDRD projects are reviewed and approved by the cognizant Federal official prior to any work starting. In addition, DOE conducts a review of each laboratory's LDRD program to ensure consistency with Department policy, and to review technical success and proposed research. In the case of the three NNSA Laboratories, the review is conducted late in the fiscal year (August/September), permitting review and concurrence of proposed research for the next fiscal year. NE and SC conduct their LDRD program reviews earlier in the year (May/June), prior to completion of the research proposal review cycle, and consequently have a separate activity later in the year that involves DOE concurrence of the next year's research portfolio. Representatives from other laboratories, as well as appropriate Departmental program managers, are invited to participate in the LDRD program reviews, to share lessons learned, and to promote best practices and continuous management improvement across the laboratories. All the laboratories have processes to review and assess the performance of individual research projects, and DOE is involved in those processes at the field offices as well as Headquarters. Again, the timing and details of this activity may vary among the program offices, but the end result is the same: corrective actions resulting from the oversight are implemented as needed, including changes in project scope, emphasis, or funding.

In addition to the specific oversight mechanisms defined in DOE 413.2A, the Department and its contractors conduct an annual evaluation of the full spectrum of science and technology at the laboratories as part of the overall evaluation of contractor performance. This evaluation spans all programmatic activities, and specifically includes LDRD, looking at its quality of science, strategic alignment, and relevance to DOE missions. Much of the input to this evaluation comes from independent external peer review committees composed of scientific leaders from industry and academia. The results of this science and technology evaluation are additional input for Headquarters in assessing the value and determining the funding level for LDRD activities.

Reporting

At the end of the fiscal year, each laboratory is required to submit an annual LDRD report to the cognizant Secretarial Officer and Site Office Manager. The LDRD Annual Report includes a technical and financial overview of the program as well as a short summary of each funded project. The Annual Report, in conjunction with the LDRD Program Plan, contains a description of the laboratory's LDRD management process, a summary of how the laboratory's LDRD portfolio relates to DOE/Laboratory missions, initiatives, and strategic plans, a description of the peer review process under which the LDRD projects are evaluated along with any relevant results; and a summary of the

metric data as success indicators. Aggregated performance indicators, such as patents, awards, and follow-on funding, collected on the LDRD portfolio at each Laboratory are useful in revealing trends on the overall productivity of the program over time, although some of the more measurable results occur years after project completion.

The Site Office reviews the laboratory's LDRD Annual Report and forwards it to the Cognizant Secretarial Officer certifying the adequacy of the laboratory's LDRD management process and Laboratory adherence to the established criteria for LDRD projects. The Cognizant Secretarial Officer also reviews each laboratory's Annual Report to assess the laboratory's LDRD management systems and program performance. As part of this review, SC, NNSA, and NE ensure that the appropriate Headquarters program managers are involved as questions related to their programs are discussed and resolved.

In its independent FY 2001 report to Congress, the General Accounting Office stated,[3]

> "All the LDRD projects we reviewed at the …laboratories we visited met DOE's guidelines for selection [and] had created the internal controls necessary to reasonably ensure compliance with DOE's guidelines. The key controls in place included using DOE's guidelines to control and conduct the project-selection process …and ensuring appropriate DOE oversight and review of the results of the process."

In summary, DOE's oversight includes project approval, financial certification reviews, appraisal process reviews, Program Plan reviews (both in the field and at headquarters) and onsite reviews (both of technical content as well as management processes). Annually, DOE issues an approval letter for each laboratory's LDRD Program Plan and confirms the maximum LDRD funding level that may be used for the program. Throughout the fiscal year, DOE works closely with each laboratory and reviews any proposed additions or adjustments to the program to ensure compliance with the DOE Order and that optimum mission benefit is realized by both DOE and the laboratories.

[3] GAO-01-927, *op. cit.*, p. 10.

Appendix 4

Laboratory Program Management

Overview

The DOE laboratories have implemented similar processes to manage their LDRD programs and select projects for funding. These processes have three major components: (1) a top-level strategic planning process to identify strategic science and technology areas for LDRD investment; (2) a call to the laboratory scientific and technical community for innovative and relevant proposals within the DOE mission areas; and (3) a scientific peer-review process to select an LDRD portfolio from these proposals, and a ranking process by senior management to prioritize the portfolio of projects for funding.

Strategic Planning

Early each fiscal year, laboratory directors and their senior management begin the LDRD cycle for the following year with a review of strategic directions, an assessment of the health of the science and technology underpinning laboratory missions, and an evaluation of the need for far-reaching fundamental research and development to maintain laboratory vitality for future missions. These activities identify the laboratory's strategic research and development needs. The review provides target allocations and determination of the LDRD program funding level as a percentage of the laboratory's total operating and capital equipment budget.

Within the LDRD program, priorities and budgets are set for three types of projects: (1) research and development demonstrations or proof-of-concept; (2) multifaceted research and development that has the potential to alter the laboratories' approach to solving programmatic challenges; and (3) long-range, high-risk fundamental research and development in broad science and technology areas underlying the laboratories' competencies and mission areas.

This process demonstrates the importance that laboratory senior management places on LDRD as a tool to maintain the vitality of the laboratories and to meet future programmatic needs and missions.

Call for LDRD Proposals

Once the strategic direction for the LDRD program is established, the laboratory LDRD program office issues calls for proposals to the scientific and technical community. This open call for proposals encourages the broadest participation from all laboratory scientific and technical staff, and ensures that the most innovative approaches are brought forward. Proposed projects range from those that focus strictly on strategic science and

technology development to those highly innovative, creative projects that enhance the capabilities of the laboratories to accomplish their missions.

Selection of Projects for Funding

All proposals are subject to two types of review: scientific peer review and management review. The scientific peer review is based on criteria that include an evaluation of the proposal's innovation, impact, risk, programmatic and strategic relevance, scientific quality, feasibility, and quality of the project team. In a recent report reviewing the LDRD Program, the General Accounting Office described the peer-review process as follows:

> "All laboratories used DOE's LDRD Order 413.2A as the primary guidance to review and select projects. Individuals involved in the review and selection of the projects had the requisite background and experience to provide credible review. Those individuals had wide-ranging scientific backgrounds—usually a Ph.D. in scientific research and practical experience in basic scientific research. When the subject matter of a project proposal was outside the knowledge base of the review team, the laboratories generally contracted with outside experts to provide reviews and recommendations on the merits of that proposal. In general, each laboratory established review panels comprising individuals from across the laboratory, which provided for diverse opinions to ensure that various points of view were brought to bear on the selection decision."

The management review includes participation by laboratory senior managers, program leaders, and leading scientists in selecting a portfolio of projects of the highest quality that are aligned with the strategic requirements of both DOE and the laboratories. Analysis of LDRD program data from the last few years indicates that the total estimated dollar value of those proposals that meet or exceed the selection criteria far exceeds the funding available at a 6 percent funding level. Each laboratory Director is responsible for final portfolio balance and project funding decisions.

In addition, the laboratories conduct reviews to assess technical progress and track project costs. In the post-performance stage, separate and independent external peer review advisory committees consisting of subject matter experts from academia and industry conduct peer reviews of LDRD projects as an integral part of the Department's scientific program reviews. These scientific peer reviews are conducted for all technical divisions on a rotating basis as part of the contract mechanism and annual performance evaluation.

The various peer review and self-assessment processes described above are designed to ensure that the laboratories' LDRD programs comply with DOE requirements, represent innovative and creative science, strengthen technical capabilities, and contribute to each institution's pursuit of excellence in science and technology. The peer review process

has evolved over several years of continuous improvement and is consistent with principles employed by other peer review processes performed by other agencies, such as the National Science Foundation and National Institutes of Health. The laboratories and DOE will continue to look for ways to improve these processes to enhance and strengthen the LDRD program.

Appendix 5

Plant Directed Research, Development and Demonstration Program

Program Overview and Philosophy

The National Nuclear Security Administration (NNSA) Defense Programs (DP) Plant Directed Research, Development and Demonstration (PDRD) Program supports science-based manufacturing related to the NNSA weapons mission. Projects emphasize applied science and technology that enhance the manager's technology development capabilities and core competencies. Technical staff at the plants have the opportunity to explore innovative scientific and technological opportunities that hold high potential for payoff in mission applications**.**

The PDRD Program described in this document is consistent with Congressional intent as stated in the Energy and Water Development Appropriations Act for FY 2001 (Section 310) and the Defense Authorization Act for FY 2001 (Section 3165) which authorized the establishment of a Plant Managers Research, Development, and Demonstration Program at the following sites:

- The Kansas City Plant (KCP), Kansas City, Missouri,
- The Y-12 Plant (Y-12), Oak Ridge, Tennessee,
- The Pantex Plant, Amarillo, Texas, and
- The Savannah River Plant (SRP), Aiken, South Carolina.

The conference agreement allows for a maximum of two percent of the plants' NNSA operating budget to be utilized for the PDRD Program. The Authorization Act and Conference Report language instruct NNSA to establish and conduct an LDRD-type program for the nuclear weapons plants. The LDRD enabling legislation serves as a guide for the PDRD Program. The authorization basis for LDRD as defined by Section 3132(d) of the National Defense Authorization Act for FY 1991 and the policy and guidance contained in DOE Order 413.2A will be followed to the extent practicable.

By extension of the LDRD authorization basis, PDRD funds are to be used for research, development, and demonstration projects that are of a creative and innovative and potentially high value to the NNSA facility conducting the effort. The projects are selected by the Contractor Manager of a site for the purpose of maintaining or improving the vitality of the enterprise in mission-related scientific disciplines. The PDRD Programs provide the NNSA nuclear weapons plant managers the flexibility to invest in longer-term, higher-risk, and potentially higher-payoff research activities that enhance the science and technology capabilities of the plants.

In structuring the PDRD Program to enhance and maintain the "vitality" of the nuclear weapons plants, specific attention will be placed on the following areas:

- Retention and recruitment of individuals with knowledge, experience, and skills that are critical to the success of site operations today and in the future;
- Exploration of enhanced core competencies and achievement of new or improved capabilities required for current and future technical missions; and
- Replenishment of the pipeline of proven concepts that can improve or replace current practices, products and processes with developing and demonstrating innovative agile process technologies.

Individual programs at each site will be structured to incorporate Defense Program goals and will be consistent with the NNSA Strategic Plan and that site's corresponding goals and objectives for the future.

Program Description - Roles & Responsibilities

The PDRD Program is analogous to the LDRD Program with appropriate differences to assure the program is focused on relevant manufacturing test technologies. It should be noted that the PDRD Program provides the site managers with broad flexibility for program implementation while NNSA's role is one of oversight and concurrence. Acting as the Cognizant Secretarial Officer designee, the Assistant Deputy Administrator for Military Applications and Stockpile Operations, through the applicable Program Manager, has primary responsibility for the PDRD Program. The NNSA Federal Site Office is responsible to assure that site program plans and accounting practices are consistent with the intent of the implementing legislation, that the projects selected are representative of the NNSA and site's strategic goals and mission, and that promising projects are highlighted to other NNSA programs for further development.

Program Components

The PDRD Program at the sites will consist of four main components:

1. A top level program planning process that results in identification of strategic manufacturing science and technology areas for targeted investment;
2. A call to plant scientific, engineering, manufacturing, and /or program management personnel for innovative and relevant proposals in the target investment areas;
3. A review process to select from the proposals a project portfolio for funding; and
4. A process for measuring and evaluating the program's effectiveness.

Fiscal Guidance

The maximum funding level established must not exceed 2 percent of the NNSA operating budget for the year as determined by Congress. The system of accrual of these funds shall, to the extent reasonable, provide for equitable pro rata contributions by all sources of NNSA funding. Construction line item projects are excluded. Expenditures shall be considered an allowable cost in accordance with the terms and conditions of the operating contract and shall be identifiable and traceable within the accounting system for ease of annual certification.

PDRD funds may not be used to substitute for or supplement funding for any tasks or project required, planned, and budgeted by the NNSA or any other agency to meet current mission needs. PDRD funds may be used to fund conceptual or preliminary designs, but may not be used to fund any construction design (e.g. Title I). PDRD funds may be used to fund capital expenditures for acquisition of general-purpose equipment as long as the equipment is required to complete the project and would not otherwise be readily available from the plant inventory. PDRD funds may not be used to supplement a site's general capital equipment budget. Occasionally a small proportion of funds may be used to survey and evaluate the suitability of competing commercially available technical solutions in order to develop an optimum procurement recommendation.

The FY 2001 Energy and Water Development Appropriations Subcommittee Conference Report directed the Chief Financial Officer (CFO) to develop and execute a financial report of expenditures by site. The CFOs of the sites are responsible for preparing this report and it will include written assurance that the method for accumulating funds is consistent with DOE Order 413.2A. In addition, CFOs shall assure that cost information reported by their site is in agreement with the site financial records.

Defense Programs' Oversight of the Program

The purpose of program oversight is to ensure that each site carries out the objectives stated in the law enabling the Program. Site Offices review the plant program and processes to ensure that they adhere to NNSA policy and guidance, are consistent with DP mission needs, and recommend approval of the program plan for the upcoming year to the Program Manager.

As part of the appraisal of overall contractor performance, the Site Office will conduct an annual evaluation of the full spectrum of activities at the site. This evaluation spans all programmatic activities, and specifically includes an evaluation of the quality of the technical work, strategic alignment, and relevance to the NNSA missions. This annual evaluation relies heavily on the site's self-assessment process. The Site Office may also conduct interviews or request written evaluations from cognizant NNSA managers for all

programs at the site. The evaluation provides additional input for senior NNSA program officials to use in assessing the value being realized from the level of funding being applied. Technical program reviews to ensure that the PDRD Program and individual projects are in support of the NNSA mission are also conducted.

The Plants participating in the program will provide, to their Site Office, a proposed program plan for the upcoming fiscal year. Both the Site Office and the Program Manager will review and analyze the plan, taking into account NNSA policy, alignment with guidance, mission relevance, strategic planning, operational needs, and general program performance. Additionally, each site's proposed plan and requested program funding level is evaluated against Congressional requirements regarding support of NNSA's national security mission. The Program Manager assembles the annual PDRD program plan which includes the individual site plans, and submits it to the cognizant Secretarial Officer or designee along with a recommendation on the plan and the program funding level. At the start of the fiscal year, the cognizant Secretarial Officer or designee assesses the plan and the Program Manager's recommendation and makes the final decision to approve the program plan.

Plants participating in the program will propose projects for review by the Site Office and the Program Manager. Site Office concurrence is required prior to initiating work on a project although the Site Office will request and address any concerns of the Program Manager before concurrence is given. Throughout the fiscal year, the Site Office works closely with their site reviewing any proposed modifications or adjustments to the program for adherence to NNSA guidelines and the site's program plan, and notifying the Program Manager of any potential issues.

Fiscal Year 2003 PDRD Program Expenditures

The following table shows FY 2003 PDRD program expenditures by site. It should be noted that the table includes all PDRD costs including individual project costs listed in Note 1 and any administrative costs not specifically assigned to individual FY 2003 projects, if applicable.

Plant	NNSA/DP Funding ($M)	PDRD Costs ($M)	PDRD Fraction
KCP	335	$5.4	1.61%
Pantex	$423.9	$5.1	1.20%
SRP	$147	$2.5	1.70%
Y-12	$554.9	$6.4	1.15%

Appendix 6

Site Directed Research, Development and Demonstration Program

Program Overview and Philosophy

The National Nuclear Security Administration (NNSA) Defense Programs (DP) Nevada Test Site Directed Research, Development and Demonstration (SDRD) program supports technology development related to the NNSA weapons mission. The program is administered by the Management and Operations contractor for the Nevada Test Site (NTS). Technical staff at NTS operational sites have the opportunity to explore innovative scientific and technological opportunities that hold high potential for payoff in mission applications.

Section 310 of H.R. 2311, the Energy and Water Development Appropriations Act for FY 2002 states "*The Administrator of the National Nuclear Security Administration may authorize the manager of the Nevada Operations Office to engage in research, development, and demonstration activities with respect to the development, test, and evaluation capabilities necessary for operations and readiness of the Nevada Test Site: Provided, That of the amount allocated to the Nevada Operations Office each fiscal year from amounts available to the Department of Energy for such fiscal year for national security programs at the Nevada Test Site, not more than an amount equal to 2 percent of such amount may be used for these activities*."

Furthermore, the Act and accompanying Conference Report authorizes NNSA to establish and conduct an LDRD-type program for the nuclear weapons plants. The LDRD enabling legislation serves as a guide for the SDRD program. The authorization basis for LDRD is defined by Section 3132(d) of the National Defense Authorization Act for FY 1991, and the policy and guidance contained in DOE Order 413.2A will be followed to the extent practicable.

By extension of the LDRD authorization basis, SDRD represents research, development and demonstration work of a creative and innovative nature selected by a senior management committee for the purpose of maintaining the vitality of the Site in mission-related scientific disciplines. SDRD provides the NNSA nuclear weapons plant and test site managers the flexibility to invest in longer-term, higher-risk, and potentially higher-payoff research activities that enhance the science and technology capabilities.

In structuring the SDRD program to enhance and maintain the "vitality" of the NTS and the technical base for carrying out the NTS DP mission, specific attention will be placed on the following areas:

- Retention and recruitment of individuals with critical skills;

- Maintenance of core competencies required for current and future technical missions; and
- Developing and demonstrating innovative, agile technology to replace outdated technology.

The program will be structured to incorporate Defense Programs' goals and will be consistent with the NNSA Strategic Plan.

Program Description - Roles & Responsibilities

The SDRD program is analogous to the LDRD program with appropriate differences to assure the program is focused on instrumentation and diagnostic technologies critical to the performance of the NTS stockpile stewardship and nuclear security response missions. The main elements and responsibility matrix for the SDRD program is given below. It should be noted that the SDRD program, like the LDRD program, provides NTS with broad flexibility for program implementation and NNSA's role is one of limited oversight and concurrence. Acting as the Cognizant Secretarial Officer designee, the Assistant Deputy Administrator for Research, Development and Simulation, through the DP Program Manager, has primary responsibility for the SDRD program. The Federal Site Office at NNSA/Nevada is responsible for implementation and oversight.

Program Components

The SDRD program will consist of three main components:

1. A top level program planning process that results in identification of strategic science and technology areas for targeted SDRD investment;
2. A call to scientific, engineering, and /or other technical personnel for innovative and relevant proposals in the target SDRD investment areas; and
3. A review process to select from the proposals a SDRD project portfolio for funding.

Program Planning. The SDRD program will use appropriate strategic plans and DP goals to identify strategic technology needs and establish SDRD objectives to address near-term, mid-term and long-term competence for assigned missions.

Call for Employee-suggested Proposals. Once the strategic direction is established, a call for proposals will be issued to the NTS scientific and engineering community. This broad-based call for proposals will result in participation of numerous scientists, engineers, and technicians yielding numerous innovative approaches to meeting the strategic SDRD objectives.

Review and Selection of Proposals for funding. All proposals are subject to two types of review, a technical review by scientists, engineers, and program management personnel, and an operational management review. The technical review is performed against

criteria that include an evaluation of the proposal's balance of innovation, impact, and risk with programmatic and strategic relevance. The management review includes participation by senior functional and programmatic management to select sound technical proposals that are aligned with the strategic goals and objectives of the NTS mission.

Fiscal Guidance

The maximum funding level established for SDRD must not exceed 2 percent of the NNSA operating budget for the year as determined by Congress. Construction line item projects are excluded. SDRD expenditures shall be considered an allowable cost in accordance with the terms and conditions of the operating contract and shall be identified in the accounting system.

The FY 2001 Energy and Water Development Appropriations Subcommittee Conference Report directed the Chief Financial Officer (CFO) to develop and execute a financial report of SDRD expenditures by project. The CFOs of the Sites are responsible for preparing this report and it will include written assurance that the method for accumulating SDRD funds is consistent with DOE Order 413.2A. In addition, CFOs shall assure that cost information reported by their Site is in agreement with the NTS financial records.

Defense Programs Oversight of the SDRD program

The SDRD oversight activities ensure that NTS carries out the objectives stated in the law enabling the Program. SDRD oversight is managed through the NNSA/NV Site Office in a process that is consistent with the LDRD oversight process. The Site Office reviews the program and process to ensure that it adheres to NNSA policy and guidance, is consistent with DP mission needs, and recommends approval of the SDRD program plan for the upcoming year to the DP Program Manager.

As part of the appraisal of overall contractor performance, NNSA/NV will conduct an annual evaluation of SDRD activities at NTS. This evaluation looks at the quality of the technical work, strategic alignment, and relevance to the NNSA missions. This annual evaluation relies heavily on the NTS self-assessment process. The result of this evaluation is additional input for DP in the assessment of the value and level of funding for the SDRD activities.

Technical program reviews to ensure that the SDRD program and individual projects are in support of the NNSA mission will be conducted in conjunction with LDRD working group meetings. Due to the similarities between the SDRD program and the Plant Directed Research Development and Demonstration (PDRD) program, SDRD Managers will also participate, when feasible, in PDRD working group meetings. The NTS SDRD

Program Manager will schedule all Principal Investigators to present their work at least once during the life of their project.

Nevada Test Site will submit to NNSA/NV and DP, a proposed SDRD program plan for the upcoming fiscal year. Both the Site Office and the DP Program Manager will review and analyze the plan, taking into account NNSA policy, alignment with guidance, mission relevance, strategic planning, operational needs, and general program performance. In coordination with the DP Program Manager, the Site Office resolves any outstanding issues with the proposed plan and provides a recommendation to the Cognizant Secretarial Officer or designee on the plan and the program funding level. Prior to the beginning of a new fiscal year, the Cognizant Secretarial Officer or designee assesses the information submitted by the sites and issues a memorandum approving the SDRD program plan and the maximum percent of the site's operating budget that may be used to fund the program.

NNSA/NV Site Office concurrence is required prior to initiating work on an SDRD project.

Fiscal Year 2003 SDRD Program Expenditures

The following table shows FY 2003 SDRD program expenditures. It should be noted that the table includes all SDRD costs including individual project costs listed in Note 1 and any administrative costs not specifically assigned to individual FY 2003 projects.

Site	NNSA/DP Funding ($M)	SDRD Costs ($M)	SDRD Fraction
NTS	$283	$4.5	1.59%